FLOOD INSURANCE STUDY

HANCOCK COUNTY, OHIO

AND INCORPORATED AREAS

Community Name	Community Number
Arcadia, Village of	390241
Arlington, Village of	390242
Benton Ridge, Village of	390243
Findlay, City of	390244
Fostoria, City of	390245
Hancock County (Unincorporated Areas)	390767
Jenera, Village of	390246
*McComb, Village of	390247
Mount Blanchard, Village of	390248
*Mount Cory, Village of	390249
*Rawson, Village of	390971
Van Buren, Village of	390648
*Vanlue, Village of	390972

*No Special Flood Hazard Areas

EFFECTIVE:
June 2, 2011

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
39063CV000A

Hancock County, Ohio
and Incorporated Areas

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this Preliminary FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult community officials and check the Community Map Repository to obtain the most current FIS components. Selected Flood Insurance Rate Map panels for this community contain the most current information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways and cross sections). In addition, former flood hazard zone designations have been changed as follows.

Old Zone(s)	New Zone
A1 through A30	AE
B	X
C	X

Initial Countywide FIS Effective Date: June 2, 2011

TABLE OF CONTENT

TABLE OF CONTENTS (continued)

FIGURES

TABLES

EXHIBITS

FLOOD INSURANCE STUDY
HANCOCK COUNTY, OHIO AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Hancock County, Ohio; including the Cities of Findlay and Fostoria; Villages of Arcadia, Arlington, Benton Ridge, Jenera, McComb, Mount Blanchard, Mount Cory, Rawson, Van Buren and Vanlue; and the unincorporated areas of Hancock County (referred to collectively herein as Hancock County). Note that the only previously printed FIS reports are for the City of Findlay, Village of Mount Blanchard and Hancock County unincorporated areas. Within the geographic area of Hancock County, no Special Flood Hazard Areas have been identified for the villages of McComb, Mount Cory and Rawson.

This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This FIS has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates. This information will also be used by the communities of Hancock County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and will also be used by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

Please note that the Village of Bluffton is geographically located in Hancock and Allen Counties and this countywide FIS does not include portions of the Village of Bluffton located in Hancock County. Also note that the City of Fostoria is geographically located in Wood County, Seneca County and Hancock County.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

This FIS was prepared to include the unincorporated areas of, and incorporated communities within, Hancock County in a countywide format. Information on the

authority and acknowledgment for each jurisdiction included in this countywide FIS, as compiled from previously printed FIS reports, is shown below.

Mount Blanchard, Village of:	The hydrologic and hydraulic analyses for this study were performed by Woolpert Consultants for the Federal Emergency Management Agency (FEMA), under contract No. H-4757. This study was completed in September, 1984 (Reference 1).
Findlay, City of:	The hydrologic and hydraulic analyses for this study were performed by U.S. Geologic Survey Water Resources Division (USGS) for FEMA, under contract No. EMW-98-IA-0175, Task Number LMMP-R5-98-01. This study was completed in September, 1999 (Reference 2).
Hancock County (Unincorporated Areas):	The hydrologic and hydraulic analyses for this study were performed by Woolpert Consultants for FEMA, under Contract No. H-4757. The study was completed in September 1984. Additional hydrologic and hydraulic data for the Blanchard River for the areas outside the vicinities of the City of Findlay and the Village of Mt. Blanchard were obtained from a study performed by the Soil Conservation service (SCS) in December 1987 (Reference 3).

For this countywide FIS, new approximate hydrologic and hydraulic analyses and redelineation of special flood hazard areas were performed by CDM Federal Programs Corporation (CDM), under contract HSFE05-2005-D-0027/TO12. This work was completed on September 25, 2009.

The digital base mapping information was provided in digital format by Hancock County, Ohio. This information was derived from data compiled from digital orthophotography dated 2006. These data meet or exceed National Mapping Accuracy Standards. Users of this FIS should be aware that minor adjustments may have been made to specific Flood Insurance Rate Map (FIRM) base map features.

The coordinate system used for the production of the FIRM is State Plane, North Ohio, North American Datum of 1983 (NAD 83), GRS 80 spheroid. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3 Coordination

An initial Consultation Coordination Officer (CCO) meeting is held typically with representatives of FEMA, USGS, Ohio Department of Natural Resources (ODNR), consultants and the community to explain the nature and purpose of a FIS and to identify the streams to be studied by detailed methods. A final CCO meeting is held typically with representatives of FEMA, USGS, consultants and the community to review the results of the FIS.

The dates of the initial and final CCO meetings held for previous FIS for jurisdictions within Hancock County are shown in Table 1, "Initial and Final CCO Meetings".

TABLE 1 – INITIAL AND FINAL CCO MEETINGS

Community	Initial CCO Date	Final CCO Date
Mount Blanchard, Village of	April 20, 1983	March 12, 1985
Findlay, City of	January 2, 2001	May 24, 2005
Hancock County (Unincorporated Areas)	April 20, 1983	May 30, 1990

For this countywide FIS, the initial CCO meeting was held on June 4th, 2008, and was attended by representatives of FEMA, ONDR, CDM and the communities. The results of the study were reviewed at the final CCO meeting held on February 3, 2010, and attended by representatives of FEMA, ODNR, the communities, CDM. All problems raised at that meeting have been addressed in this study.

2.0 **AREA STUDIED**

2.1 Scope of Study

This FIS covers the geographic areas of Hancock County, Ohio including the incorporated communities listed in Section 1.1. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

All or portions of the flooding sources listed in Table 2, "Flooding Sources Studied by Detailed Methods," were previously studied by detailed methods. The limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRMs (Exhibit 2).

TABLE 2 – FLOODING SOURCES STUDIED BY DETAILED METHODS

Flooding Source	Limits of Detailed Study
Blanchard River	From the boundary with Hardin County to the boundary with Putnam County.

TABLE 2 – FLOODING SOURCES STUDIED BY DETAILED METHODS
(continued)

Flooding Source	Limits of Detailed Study
Eagle Creek	From approximately 250 ft upstream of Township Road 32 to the confluence with the Blanchard River.
Howard Run	From approximately 1,200 ft upstream of County Highway 95 to the confluence with the Blanchard River.
Lye Creek	From approximately 1 mi upstream of Township Road 205 to the confluence with the Blanchard River.
Rush Creek	From approximately 1,000 ft upstream of Greendale Avenue to the confluence with the Blanchard River.

This FIS also incorporates the determinations of letters issued by FEMA resulting in map changes (Letter of Map Revision [LOMR], Letter of Map Revision-based on Fill [LOMR-F], and Letter of Map Amendment [LOMA]) as shown in Table 3, "Letters of Map Change."

TABLE 3 – LETTERS OF MAP CHANGE

Community	Case Number	FloodingSource(s)	Letter Date
City of Findlay	07-05-0365A	Lye Creek; Blanchard River	1/18/2007
City of Findlay	07-05-1818A	Lye Creek; Blanchard River	1/18/2007
City of Findlay	07-05-0775P	Blanchard River	1/31/2007
City of Findlay	07-05-0779A	Blanchard River	2/6/2007
City of Findlay	07-05-2706A	Blanchard River	3/20/2007
City of Findlay	07-05-2762A	Lye Creek; Blanchard River	5/3/2007
City of Findlay	07-05-3677A	Blanchard River	6/12/2007
City of Findlay	08-05-2086P	Blanchard River	5/15/2008
Hancock County	04-05-4230A	Eagle Creek	9/1/2004

TABLE 3 – LETTERS OF MAP CHANGE (continued)

Community	Case Number	FloodingSource(s)/Project Identifier	Letter Date
Hancock County	09-05-2984P	Blanchard River	11/4/2009

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and the ODNR. These analyses superseded the approximate reaches in the original study or added new approximate study reaches for the following: Aurand Run, Blanchard River and tributaries, Binkley Ditch, Boley Ditch, Brights Ditch, Buck Run, Buck Run Creek, Cummins Ditch, Eagle Creek, East Branch Portage River and tributaries, Flat Branch, Howard Run, Little Riley Creek, Lye Creek and tributaries, Marsh Run, Moffitt Ditch and tributaries, Needles Creek, Ottawa Creek and tributaries, Potato Run, Rader Creek, Riley Creek and tributaries, Rocky Ford Creek and tributaries, Schoonover Ditch, Silver Creek, South Branch Portage River, Stahl Ditch, Tenmile Creek, The Outlet, Tiderishi Creek and Woodruff Ditch.

2.2 Community Description

Hancock County, in northwestern Ohio, has a total area of 534 square miles (sq. mi.). The county is bordered on the north by the Wood County; Seneca and Wyandot Counties to the east; on the south Hardin County; on the west by Allen and Putnam Counties and on the northwest corner by Henry County. The county sit is in the City of Findlay. Hancock County is primarily rural, with nearly 95 percent of its land cultivated.

Hancock County is served by several major highways including Interstate 75 and U.S. Routes 30, 68, and 224. Railroads within the county include Conrail, CSX, and Norfolk Southern Railway. The population of Hancock County was 71,295 in 2000, 65,536 in 1990, and 64,581 in 1980 (Reference 4).

The climate of Hancock County is influenced by Lake Michigan, consists of cold winters and warm summers. The average temperature is 51 degrees Fahrenheit (°F), with seasonal variations ranging from a mean of 18.6 °F in January to 87 °F in July. Average annual precipitation is about 35.8 inches, and the average annual snowfall is about 28 inches (Reference 5).

The soils of Hancock County are typical heterogeneous materials found in the till plains covering mid-Ohio, consisting primarily of clays overlying dolomitic limestone. The glacial drift is of varied thickness, averaging less than 15 feet. Weathered rock is evident along most river channel bottoms (Reference 6).

All streams in the area studied are within the Maumee River basin, which has a total drainage area of 6,608 square miles. The drainage system in Hancock County consists of the Blanchard River and several main tributaries (Reference 7). The Blanchard River, from its source in Hardin County nears the City of Kenton, flows north in Hancock County for 26 miles and then very sharply westward for 5 miles to the City of Findlay. Several major tributaries that form the eastern portion of the basin rise in Wyandot and Seneca Counties, and join the Blanchard River upstream of the City of Findlay. The Blanchard River empties into the Auglaize River about 55 river miles downstream of the City of Findlay. Eagle Creek, which has a drainage area of 61.4 sq. mi. (Reference 8), also has its source in Hardin County and generally parallels the Blanchard River throughout its length and joins that river in the City of Findlay. The drainage basin of Lye Creek, another principal tributary of the Blanchard River, lies entirely in Hancock County between Eagle Creek and the Blanchard River. Lye Creek also has its confluence with the Blanchard River in the City of Findlay.

2.3 Principal Flood Problems

Although flooding can occur at any time during the year, floods are most frequent during the late winter and spring months when heavy rains combine with melting snow.

Flooding occurred throughout much of Ohio in March 1913 as a result of one of the most intense rainstorms ever recorded in northwestern Ohio. However, no specific information was obtained for this flood relative to the streams in Hancock County.

Hancock County is susceptible to floodflows of the Blanchard River, Eagle Creek, and Lye Creek. Flooding may occur from individual flood discharges of these water courses, but usually occurs in some combination with the Blanchard River. High water is experienced annually along these rivers but the flooding is usually restricted to the immediate banks and the surcharged sewer systems. Flooding seriously affects the residential and commercial streets by overland flow from the streams, and occurs on the average of once in every five years. Extremely high stormwater flows cover large sections of the county that lie within the natural floodplain associated with the confluence of the rivers. The worst flood of modern record occurred in 1913 and completely inundated the business districts adjacent to the City of Findlay for several days. The Blanchard River discharge for this flood was estimated to be 22,000 cubic feet per second (cfs), well in excess of a 0.2-percent-annul-chance flood. The low areas along both sides of the Blanchard River upstream and downstream of the city are the first to be subjected to flooding when the river stage reaches approximately 12 feet at the USGS gaging station (No. 4189000) downstream of the City of Findlay. The rise and fall of flood crests on the Blanchard River usually extend over a period of two to three days. This period is increased to four or five days during extremely severe floods (Reference 8).

The urban area near the City of Findlay is flooded about once every five years, with serious flooding being recorded in 1883, 1888, 1904, 1913, 1927, 1950, 1959, and 1981. The storm of June 13-15, 1981, produced the highest discharge on the Blanchard River since the 1913 flood. The average precipitation of 4.5 inches in 24 hours produced 13,000 cfs at the Blanchard River gage and had an estimated recurrence interval of about 2-percent-annual-chance (Reference 9). This was a regionalized storm, with the central area of the county receiving a large portion of the rainfall. The estimated damage of the June 1981 flood was $13 million, mainly in residential areas including the City of Findlay (Reference 10).

In January and February 1959, two severe floods occurred in Hancock County within 20 days of one another. The storm of January 19-22, 1959, produced the most severe flood since 1913 in most parts of Ohio, whereas the storm of February 9-10, 1959, produced a higher discharge on the Blanchard River than the January storm. This was due to the saturated, frozen ground produced by the preceding storm and a lack of snow cover (Reference 11).

Eagle Creek has an average slope of about 7.4 feet per mile with a high runoff. The two highest floods of record are the February 1959 and June 1981 events. These produced estimated discharges of 5,860 cfs and 6,300 cfs, respectively, both in excess of an l-percent-annual-chance flood at the stream gage (No. 04188500) upstream of City of Findlay (Reference 9).

The flat terrain of the county causes Eagle Creek and Lye Creek floodplains to join just upstream of Sixth Street. This created a mile-wide flooded area in the June 1981 flood.

In 1997 the Blanchard River at the City of Findlay exceeded its flood stage again, cresting at 13.7 feet in May and 15.5 feet in June. Others countywide floods were registered in January of 2005 and 2007 due to snow storm melt followed by heavy rains. However, one of the worst flood events in the region occurred in August 2007 causing approximately $100 million in damage. About 2,000 people had to be evacuated and water rescue teams from the surrounding area assisted in the efforts. The catastrophic thunderstorms affected Wyandot, Hancock, Crawford and Richland Counties (Reference 12).

2.4 Flood Protection Measures

Levees exist in the study area that provides the community with some degree of protection against flooding. However, it has been ascertained that some of these levees may not protect the community from rare events such as the 1-percent-annual-chance flood. The criteria used to evaluate protection against the 1-percent-annual-chance flood are 1) adequate design, including freeboard, 2) structural stability, and 3) proper operation and maintenance. Levees that do not protect against the 1-percent-chance-annual flood are not considered in the hydraulic analysis of the 1-percent-annual-chance floodplain.

For the City of Findlay the local sewage treatment plant is protected by a levee that has a top elevation slightly above the 1913 flood level. This levee has performed without any known damaging incidents. Due to the hydraulic design of the sewage treatment system, the treatment plant becomes inoperative when flood stages on the Blanchard River exceed elevation 758.2 North American Vertical Datum of 1988 (NAVD88). Closure gates prevent backwater from entering the plant. Other levees within the corporate limits are along Eagle Creek at the following locations: upstream of the Sixth Street bridge on the right bank to protect a housing development; downstream of Olive Street on the left bank to protect a clay tile manufacturing plant; and upstream of the CSX railroad bridge on the left bank to prevent floodwaters from becoming trapped behind the railroad embankment. These levees afford little protection against floods similar to those experienced in 1913, 1959, or 1981, but they have been beneficial at low discharges (Reference 2).

The county regulates the use of floodplains through local building codes and zoning ordinances (Reference 13). These include land use regulations adopted from the Code of Federal Regulations to control development within areas that have a high risk of flooding.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (l-percent chance of annual exceedance) in any 50-year period is approximately 40 percent (4 in 10), 100, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect

flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for the flooding sources studied in detail affecting the county.
Village of Mount Blanchard, City of Findlay and Hancock County Unincorporated Areas has a previously printed FIS report. The hydrologic analyses described those reports have been compiled and summarized below.

Pre-Countywide Analysis:

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The USGS has maintained stream gage records on the Blanchard River (gage No. 04189000) and has recorded all major floods since 1923 except for the period from 1935 to 1940 (Reference 14). The maximum stage records at the City of Findlay sewage treatment plant have been used to estimate the maximum annual discharges during this interim period. Another gage, on Eagle Creek (gage No. 04188500) just south of the City of Findlay, was operated by the USGS from 1947 to 1957 (Reference 14).

For the original Hancock County study the discharge data from the Blanchard River gage were used to develop the values for the 10-, 2-, and 1-percent-annual-chance peak discharges (Reference 14). The flood frequency analysis performed by Woolpert Consultants followed the standard log-Pearson Type III method (Reference 14). These discharges were adjusted at major drainage area breaks using methods recommended by the ODNR (Reference 14).

The remaining Blanchard River discharges were established by valley routing, using the USGS watershed model (Reference 15).

For the City of Findlay study estimates of the 1-percent-annual-chance peak discharges on the Blanchard River were based upon streamflow-gaging station historical data and techniques to determine station weighted regression estimates as presented in the USGS's Water-Resources Investigations Report 89-4126, "Techniques for Estimating Flood-Peak: Discharges of Rural, Unregulated Streams in Ohio," (Reference 16). The historical data used for this hydrologic analysis includes a period of 61 years (1913, 1924-1936, 1941-1987). These techniques were used to obtain peak- discharge estimates at three locations along the Blanchard River: (1) upstream of Hancock County Road 140 (location of the USGS streamflow-gaging station, Blanchard River near Findlay), (2) upstream of Eagle Creek, and (3) upstream of Lye Creek.

The estimate of the 1-percent-annual-chance peak discharge for Eagle Creek is based on historical USGS streamflow-gaging station records for Eagle Creek near the City of Findlay streamgage (Reference 16). The historical data used for this hydrologic analysis includes a period of 13 years (1947-1957, 1959, 1981). The peak-discharge estimate will be used for the entire reach studied along Eagle Creek.

The estimates of 1-percent-annual-chance peak discharges for Lye Creek were computed by use of a regression equation presented in the USGS's Water-Resources Investigations Report 89-4126 (Reference 10). The data required for the use of this equation are drainage area in square miles, main channel slope in 5 feet per mile, and storage area in percent of drainage area. The basin-characteristics data for Lye Creek were obtained directly from USGS 7.5-Minute Series Topographical maps. This technique was used to obtain peak-discharge estimates at two locations along Lye Creek: (1) at the mouth, and (2) upstream of Fishlock Avenue at City of Findlay.

Stream discharges for Eagle Creek in the original Hancock County study were determined by a combination of the stream gage data and regression analyses (Reference 14). Because of the short duration of the Eagle Creek gage data, methods outlined in Bulletin No. 17B (Reference 17) for comparison of short period and long period gage records on Eagle Creek and the Blanchard River, respectively, were used to establish the discharge values. Lye Creek, an ungaged stream, and the Blanchard River near Mount Blanchard were evaluated by the regression methods recommended for this region of Ohio (Reference 14). The mathematical model is based on 33 gaging stations in the Lake Erie drainage basin from the Ohio-Michigan state boundary line eastward through the Maumee River, Portage River, and Sandusky River basins. Principal parameters include drainage areas, stream slopes, and mean annual precipitation. Adjustments for urbanization were made at the extreme downstream reaches of Eagle and Lye Creeks.

Howard Run and Rush Creek have a relatively small drainage area, and the methods described in TR-55 were used to establish peak discharge values (Reference 18). The 0.2-percent-annual-chance flood discharges were extrapolated from a statistical plot of the 10-, 2-, and 0.2-percent-annual-chance flood discharges for each stream studied in detail.

The stream discharge data published in Bulletin No. 45 (Reference 14) for the Blanchard River gage were revised in 1981 by the USGS to reflect the June 1981 flood and all others since 1975. These values are used to determine the flood profiles for this study.

This Countywide analysis:

For this study the discharges for Hancock County were determined using the regression equations available in StreamStats for Ohio. The GIS applies StreamStats to facilitate the estimations of streamflow statistics at ungaged streams (Reference 19). Flood-frequency estimates determined by means of log-Pearson Type III analyses are reported along with weighted floodfrequency estimates, computed as a function of the log-Pearson Type III estimates and the regression estimates (Reference 20). A discharge-drainage area relationship was developed for each river to determine discharge at various locations in the study reaches.

A summary of the drainage area-peak discharge for the 10-, 2-, 1- and 0.2-percent-annual-chance floods of each stream studied by detailed methods is shown in Table 3, "Summary of Discharges".

TABLE 4 – SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	l-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
BLANCHARD RIVER					
Just upstream of western county boundary	*	9,500	13,200	14,200	16,700
About 800 feet upstream of confluence of Aurand Run	*	8,400	11,900	12,500	14,300
Just upstream of Hancock County Road 140	346	*	*	14,100	*
Just upstream of confluence of Eagle Creek	274	*	*	10,900	*
Just upstream of confluence of Lye Creek	246	*	*	9,830	*
Just upstream of confluence of The Outlet	192	5,015	6,550	7,150	8,200
Just downstream of confluence of Potato Run	141	3,930	5,147	5,630	6,490
Just downstream of southern county boundary	*	3,300	4,500	4,700	5,200
EAGLE CREEK					
Just upstream of confluence of Blanchard River	61.4	*	*	4,115	*
At County Route 45	50.9	3,195	4,130	4,475	5,150
At County Route 26	44.0	2,590	3,380	3,680	4,250
Just downstream of confluence of Buck Run	37.7	2,090	2,750	3,005	3,500
Just upstream of confluence of Buck Run	31.1	1,620	2,150	2,365	2,740

TABLE 4 – SUMMARY OF DISCHARGES (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	l-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
LYE CREEK					
Just upstream of confluence with Blanchard River	28	*	*	1,910	*
Just upstream of Fishlock Avenue	27	*	*	1,880	*
HOWARD RUN					
Just upstream of confluence with Blanchard River	4.7	610	790	860	1,040
RUSH CREEK					
Just upstream of confluence with Blanchard River	1.7	550	795	840	950

*Data not available

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

Village of Mount Blanchard, City of Findlay and the Hancock County Unincorporated Areas are the only previous FIS reports printed for Hancock County. The hydraulic analyses described in that report have been compiled and summarized below.

Pre-Countywide Analysis:

Cross-sections for backwater analyses were obtained through photogrammetric means from aerial photographs (References 15 and 21). Additional cross sections, below-water sections, and bridge data were obtained by field survey. All bridges and culverts were surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and on the FIRM.

Water-Surface Elevations (WSELs) for floods of the selected recurrence intervals for Eagle Creek, Howard Run, Lye Creek, and on portions of the Blanchard River within the vicinities of the City of Findlay and the Village of Mount Blanchard were computed using the HEC-2 step-backwater computer program (Reference 22). Normal depth starting WSELs for Howard Run and Rush Creek were calculated by slope-area method. Flood profiles were drawn showing the computed WSELs for floods of the selected recurrence intervals.

The WSELs for the remaining portions of the Blanchard River were obtained from the WSP-2 step-backwater program in the original Hancock County FIS (Reference 23). Starting water-surface elevations were calculated by the slope-area method.

For the FIS revision of City of Findlay, cross sections the surveyed in the field and cross sections obtained from a digital 2-foot contour map developed for this restudy were used to establish the 1-percent-annual-chance floodplain and floodway for the Blanchard River, Eagle Creek, and Lye Creek (Reference 24). Estimates of 1-percent-annual-chance peak discharges were used with cross-sectional data as input data to develop a step-backwater model. The USACE's HEC-RAS step-backwater computer program (Reference 20) was used to determine the WSELs for the Blanchard River, Eagle Creek and Lye Creek. The starting WSEL at the initial section for the 1-percent-annual-chance flood profile for the Blanchard River was determined from the stage-discharge relation from the USGS stream gage "Blanchard River near Findlay" (No. 04189000). A known starting WSEL was used for the Blanchard River for this revision. The starting WSELs at the initial sections for the 1-percent-annual-chance flood profile for Eagle Creek and Lye Creek were obtained using the slope conveyance method.

This Countywide Analysis:

For the flooding sources which are studied by approximate analyses and listed in “2.1 Scope of Study”, HEC-GeoRAS was used to convert centerline and cross section data created in ArcGIS (Reference 19) for use in HEC-RAS 4.0 (Reference 20). HEC-GeoRAS utilized a 2.5 feet resolution Digital Elevation Model (DEM) generated under the Ohio Statewide Imagery Program (OSIP) to develop the model cross sections. The same DEM was used for floodplain mapping. Road crossing locations were selected by looking at the aerial photos and modeled as inline structures. Normal depth was used as the downstream boundary condition for reaches in this study.

Roughness coefficients (Manning's "n") listed below at table 4 and contraction and expansion loss coefficients used in the hydraulic computations were chosen by engineering judgment and based on field observation of the streams and floodplain areas.

TABLE 5 – MANNING'S "N" VALUES

STREAM	CHANNEL	OVERBANKS
Blanchard River	0.026-0.063	0.041-0.187
Eagle Creek	0.055-0.075	0.11
Lye Creek	0.055-0.075	0.11
Howard Run	0.03-0.055	0.04-0.10
Rush Creek	0.030-0.055	0.040-0.100

Flood profiles were drawn showing the computed WSELs for floods of the selected recurrence intervals. In cases where the 2- and 1-percent-annual-chance flood elevations are close together, due to limitations of the profile scale, only the 1-percent-annual-chance profile has been shown.

For flooding sources which are studied by detailed analyses, locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the FIRM (Exhibit 2).

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.3 Vertical Datum

All FISs and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FISs and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD). With the completion of the North American Vertical Datum of 1988 (NAVD), many FIS reports and FIRMs are now prepared using NAVD as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRM are referenced to NAVD. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. Some of the data used in this revision were taken from the prior effective FIS reports and FIRMs and adjusted to NAVD. The datum conversion factor from NGVD to NAVD in Hancock County is -0.5 feet (NGVD – 0.5= NAVD).

TABLE 6 – VERTICAL DATUM CONVERSION FACTORS

Quad Name	Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (ft)
Ada	NE	40.875	83.75	-0.459
Ada	NW	40.875	83.875	-0.482
Alvada	NE	41.125	83.375	-0.584
Alvada	SE	41	83.375	-0.436
Alvada	SW	41	83.5	-0.463
Alvada	NW	41.125	83.5	-0.581
Arcadia	SW	41	83.625	-0.482
Arcadia	NW	41.125	83.625	-0.561
Arlington	SE	40.875	83.625	-0.443
Arlington	NW	41	83.75	-0.502
Bluffton	NE	41	83.875	-0.522
Carey	SW	40.875	83.5	-0.427
Deshler	SE	41.125	83.875	-0.591
Findlay	NW	41.125	83.75	-0.581

For additional information regarding conversion between the NGVD and NAVD, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the

Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, descriptions, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program (NFIP) encourages state and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1-percent-annual-chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplains; and 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section.

Between cross sections, the boundaries were interpolated using topographic information with a contour interval of 4 feet derived from Ohio Statewide Imagery Program (O.S.I.P.) photographic data. However, for the City of Findlay topographic maps at a scale of 1:12000 feet resulted in a contour interval of 2 feet.

The 1-percent-annual-chance and 0.2-percent-annual-chance floodplain boundaries are shown on the Flood Insurance Rate Map. On this map, the l-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE) and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM.

4.2 Floodways

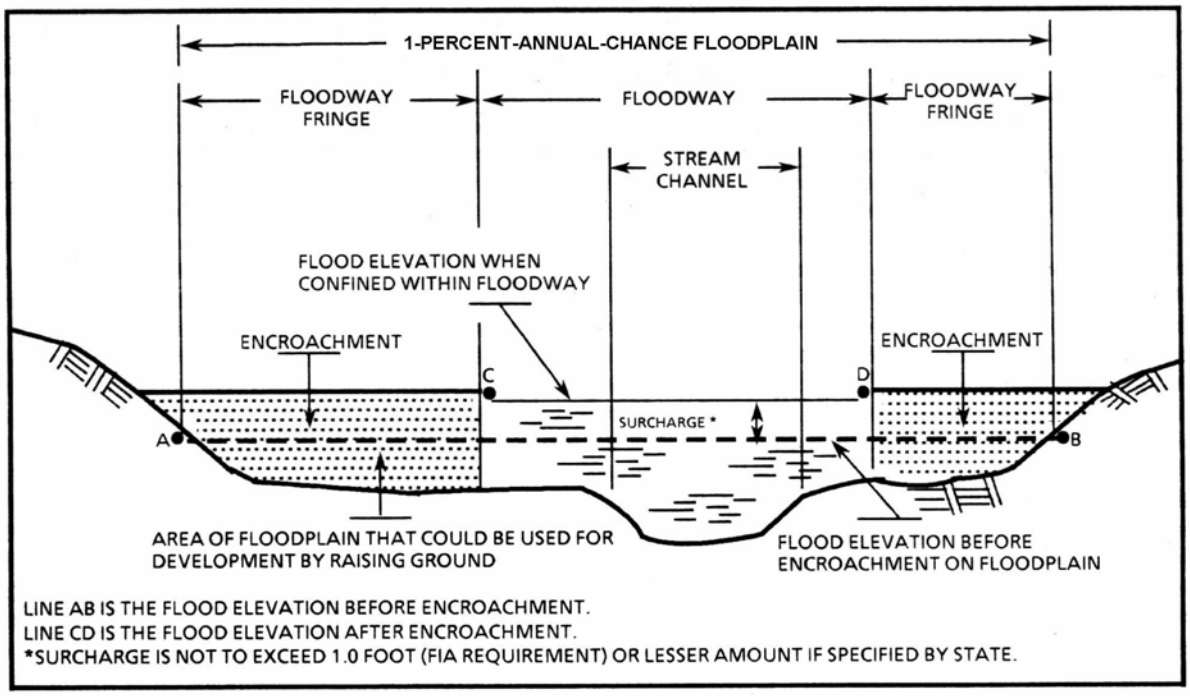
Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

In the redelineation efforts, the floodways were not recalculated. As a result, there were areas where the previous floodway did not fit within the boundaries of the redelineated 1-percent annual chance floodplain. In these areas, the floodway was reduced. WSELs, with and without a floodway, the mean velocity in the floodway, and the location and area at each surveyed cross section as determined by the hydraulic methods can be seen in Table 5. The width of the floodway depicted by the FIRM panels and the amount of reduction to fit the floodway inside the 1-percent annual chance floodplain, if necessary, is also listed.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 5, Floodway Data). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either closer together or collinear, only the floodway boundary is shown.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the WSEL of the base flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

FIGURE 1 – FLOODWAY SCHEMATIC



FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	183642	1,462	7,437	1.9		748.1	748.1	749.1	1.0
B	184962	1,216	9,062	1.6		748.3	748.3	749.3	1.0
C	186757	1,104	8,200	1.7		748.8	748.8	749.8	1.0
D	189186	1,428	10,867	1.3		749.2	749.2	750.2	1.0
E	192090	1,504	13,430	1.1		749.5	749.5	750.5	1.0
F	193515	2261	11405	1.3		749.7	749.7	750.7	1.0
G	195522	1206	8477	1.7		750.0	750.0	751.0	1.0
H	199535	1591	10239	1.4		750.5	750.5	751.5	1.0
I	200855	1969	14155	1.0		751.0	751.0	752.0	1.0
J	206451	1594	13356	1.1		751.6	751.6	752.6	1.0
K	209672	1617	9951	1.4		752.2	752.2	753.2	1.0
L	215586	1726	10237	1.4		753.1	753.1	754.1	1.0
M	217487	1141	6126	2.3		753.6	753.6	754.6	1.0
N	219335	812	6372	2.2		754.4	754.4	755.4	1.0
O	221235	422	4275	3.3		755.1	755.1	756.1	1.0
P	224139	608	4920	2.7		756.3	756.3	757.3	1.0
Q	225829	589	7464	1.8		756.8	756.8	757.8	1.0
R	227835	691	7706	1.7		757.2	757.2	758.2	1.0
S	230528	1469	9541	1.4		757.7	757.7	758.7	1.0
T	234383	1639	16339	0.8		757.8	757.8	758.8	1.0
U	236336	730	6049	2.2		758.3	758.3	759.3	1.0
V	240032	1088	9578	1.4		758.7	758.7	759.7	1.0
W	242250	770	7810	1.7		760.5	760.5	761.5	1.0
X	244309	433	5049	2.6		761.2	761.2	762.2	1.0
Y	245523	655	6395	2.1		761.7	761.7	762.7	1.0
Z	250592	1351	10489	1.3		762.3	762.3	763.3	1.0
AA	252968	312	3697	3.6		763.5	763.5	764.5	1.0

[1] FEET ABOVE CONFLUENCE WITH AUGLAIZE RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

BLANCHARD RIVER

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AB	255080	348	3019	4.1		764.6	764.6	765.6	1.0
AC	256347	382	4229	3.0		765.2	765.2	766.2	1.0
AD	257245	258	3621	3.5		765.6	765.6	766.6	1.0
AE	263159	1181	9925	1.4		769.0	769.0	770.0	1.0
AF	266696	548	7068	2.0		770.1	770.1	771.1	1.0
AG	268703	565	6944	2.0		770.7	770.7	771.7	1.0
AH	269495	549	7065	2.0		770.9	770.9	771.9	1.0
AI	270107	900	10374	1.4		771.7	771.7	772.7	1.0
AJ	272073	800	8656	1.6		772.2	772.2	773.2	1.0
AK	272746	800	6902	2.0		772.4	772.4	773.3	0.9
AL	274474	800	7816	1.8		773.0	773.0	773.9	0.9
AM	275228	540	6775	2.1		773.2	773.2	774.1	0.9
AN	276326	460	6643	2.1		773.9	773.9	774.8	0.9
AO	277341	460	7156	2.0		773.9	773.9	774.8	0.9
AP	278680	695	4497	3.1		774.5	774.5	775.3	0.8
AQ	279333	880	12906	1.1		774.7	774.7	775.5	0.8
AR	280675	840	7577	1.9		774.8	774.8	775.7	0.9
AS	281477	724	6334	2.2		775.1	775.1	776.0	0.9
AT	282336	775	7788	2.4	62	776.0	776.0	776.8	0.8
AU	283436	800	7344	1.9		777.3	777.3	778.0	0.7
AV	284489	800	4965	2.8		777.9	777.9	778.8	0.9
AW	285451	800	8315	1.3		778.4	778.4	779.4	1.0
AX	286324	795	6395	1.5		778.5	778.5	779.5	1.0
AY	287440	600	5313	1.9		778.7	778.7	779.7	1.0
AZ	289093	377	6467	1.5		779.1	779.1	780.0	0.9
BA	289721	600	6251	1.6		779.1	779.1	780.0	0.9
BB	290883	600	6706	1.5		779.3	779.3	780.2	0.9

[1] FEET ABOVE CONFLUENCE WITH AUGLAIZE RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

BLANCHARD RIVER

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
BC	292564	600	6939	1.4		779.4	779.4	780.3	0.9
BD	293710	600	4811	2.0		779.5	779.5	780.4	0.9
BE	294802	525	4472	2.2		779.8	779.8	780.7	0.9
BF	295835	600	4573	2.2		780.5	780.5	781.3	0.8
BG	296897	600	6604	1.5		780.9	780.9	781.6	0.7
BH	297738	600	6125	1.6		781.0	781.0	781.8	0.8
BI	298574	600	5979	1.6		781.1	781.1	782.0	0.9
BJ	299619	510	5090	1.9		781.2	781.2	782.2	1.0
BK	300512	610	6455	1.5		781.6	781.6	782.5	0.9
BL	301923	950	8219	1.2		781.9	781.9	782.7	0.8
BM	302997	950	5212	1.9		782.1	782.1	782.9	0.8
BN	304218	1160	7022	1.4		782.6	782.6	783.4	0.8
BO	305150	1010	4900	2.0		782.8	782.8	783.8	1.0
BP	306249	736	4680	2.1		783.7	783.7	784.5	0.8
BQ	308421	650	4768	2.1		785.5	785.5	786.0	0.5
BR	309731	650	4474	2.2		786.3	786.3	786.8	0.5
BS	310823	522	4456	1.9		786.6	786.6	787.6	1.0
BT	313358	1941	15452	0.6		787.1	787.1	788.1	1.0
BU	315522	447	4073	1.8		787.4	787.4	788.3	0.9
BV	319007	597	3073	2.5		789.5	789.5	790.5	1.0
BW	320486	308	1955	4.0		791.1	791.1	792.1	1.0
BX	321700	282	1486	5.3		792.5	792.5	793.5	1.0
BY	323759	449	2695	2.9		793.9	793.9	794.9	1.0
BZ	324815	575	3844	1.7		794.6	794.6	795.6	1.0
CA	326716	1378	8828	0.8		794.8	794.8	795.8	1.0
CB	328194	891	5275	1.3		795.2	795.2	796.2	1.0
CC	329778	396	2709	2.5		796.2	796.2	797.2	1.0

[1] FEET ABOVE CONFLUENCE WITH AUGLAIZE RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

BLANCHARD RIVER

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
CD	331257	162	1596	4.2		797.0	797.0	798.0	1.0
CE	332471	400	3009	2.2		797.4	797.4	798.4	1.0
CF	334794	296	2478	2.7		798.4	798.4	799.4	1.0
CG	337804	1718	6433	1.0		798.7	798.7	799.7	1.0
CH	339124	561	2061	3.3		799.4	799.4	800.4	1.0
CI	340814	866	3583	1.9		801.4	801.4	802.4	1.0
CJ	342292	639	2958	2.3		802.0	802.0	803.0	1.0
CK	343454	411	2029	3.3		803.6	803.6	804.6	1.0
CL	344879	1330	4613	1.4		804.0	804.0	805.0	1.0
CM	346516	514	2057	3.2		805.0	805.0	806.0	1.0
CN	349050	710	2477	2.6		806.1	806.1	807.1	1.0
CO	351954	347	1692	3.8		808.4	808.4	809.4	1.0
CP	354858	233	2254	2.9		810.9	810.9	811.9	1.0
CQ	356970	718	3973	1.6		811.3	811.3	812.3	1.0
CR	359294	537	4115	1.6		811.9	811.9	812.9	1.0
CS	361247	894	4162	1.6		812.3	812.3	813.3	1.0
CT	363042	1142	5616	1.2		812.7	812.7	813.7	1.0
CU	363887	653	4128	1.6		813.2	813.2	814.2	1.0
CV	365313	665	3210	2.0		814.3	814.3	815.3	1.0
CW	367214	598	2487	2.6		815.3	815.3	816.3	1.0
CX	369801	741	2470	2.6		816.7	816.7	817.7	1.0
CY	371385	654	2697	2.4		817.4	817.4	818.4	1.0
CZ	373550	608	2563	2.5		818.4	818.4	819.4	1.0
DA	374606	340	2695	2.1		820.1	820.1	821.0	0.9
DB	375978	297	2960	1.9		821.0	821.0	821.8	0.8
DC	377140	343	2930	1.9		821.3	821.3	822.1	0.8
DD	379146	832	5076	0.9		821.8	821.8	822.6	0.8

[1] FEET ABOVE CONFLUENCE WITH AUGLAIZE RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

BLANCHARD RIVER

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
DE	380783	516	3714	1.3		822.2	822.2	823.1	0.9
DF	382684	463	2800	1.7		822.9	822.9	823.8	0.9
DG	384374	819	2860	1.7		824.4	824.4	825.4	1.0
DH	385482	95	774	6.2		827.7	827.7	828.2	0.5
DI	386169	134	1122	4.3		829.3	829.3	829.9	0.6
DJ	386697	589	3760	1.3		830.2	830.2	830.9	0.7
DK	388439	776	3691	1.3		830.8	830.8	831.6	0.8
DL	390287	486	2780	1.7		831.6	831.6	832.5	0.9
DM	392135	419	2015	2.4		832.9	832.9	833.9	1.0
DN	392716	596	3032	1.9		833.4	833.4	834.4	1.0
DO	393561	503	2724	2.1		833.9	833.9	834.9	1.0
DP	394934	208	1491	3.8		835.6	835.6	836.6	1.0
DQ	395620	198	1029	5.0		836.7	836.7	837.7	1.0
DR	397785	306	2156	2.4		838.7	838.7	839.7	1.0
DS	401903	279	1376	3.4		842.3	842.3	843.3	1.0
DT	404438	497	1733	2.7		843.8	843.8	844.8	1.0
DU	406761	420	2069	2.3		846.8	846.8	847.8	1.0
DV	407606	398	2178	2.2		847.8	847.8	848.8	1.0
DW	410087	504	1909	2.5		849.4	849.4	850.4	1.0
DX	411407	390	1322	3.6		852.1	852.1	853.1	1.0
DY	413150	150	973	4.8		857.2	857.2	858.2	1.0
DZ	415050	426	2150	2.2		859.7	859.7	860.7	1.0
EA	417743	1188	2702	1.7	532	861.2	861.2	862.2	1.0
EB	419538	330	1496	3.1		862.4	862.4	863.4	1.0
EC	422442	621	2631	1.8		863.2	863.2	864.2	1.0
ED	425294	681	3653	1.3		864.4	864.4	865.4	1.0
EE	427458	324	2324	2.0		865.3	865.3	866.3	1.0

[1] FEET ABOVE CONFLUENCE WITH AUGLAIZE RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

BLANCHARD RIVER

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
EF	428778	727	2217	2.1		866.1	866.1	867.1	1.0
EG	431049	938	3299	1.4		867.9	867.9	868.9	1.0
EH	433161	573	3,110	1.5		868.8	868.8	869.8	1.0
EI	434956	320	1,744	2.7		870.1	870.1	871.1	1.0
EJ	437385	297	1,969	2.4		872.9	872.9	873.5	0.6
EK	439814	1496	8,305	0.6		873.8	873.3	874.1	0.8

[1] FEET ABOVE CONFLUENCE WITH AUGLAIZE RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

BLANCHARD RIVER

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	4,620	264	914	4.5		778.0	777.5 [2]	777.6	0.1
B	5,476	235	1,169	3.5		778.2	778.2	778.4	0.2
C	6,677	235	985	4.2		779.0	779.0	779.4	0.4
D	7,341	230	861	4.8		779.7	779.7	780.1	0.4
E	8,887	320	1,795	2.5		781.6	781.6	782.1	0.5
F	10,297	350	1,207	3.8		782.2	782.2	782.7	0.5
G	11,583	370	1,465	3.1		783.2	783.2	783.9	0.7
H	12,133	280	1,151	3.9		783.5	783.5	784.4	0.9
I	13,731	180	783	5.8		785.9	785.9	786.4	0.5
J	14,119	130	1,014	4.5		787.1	787.1	787.2	0.1
K	15,345	120	1,119	4.0		787.8	787.8	788.3	0.5
L	15,464	125	1,242	3.6		788.2	788.2	788.8	0.6
M	16,086	440	2,574	1.8		788.5	788.5	789.1	0.6
N	16,579	440	2,743	1.7		788.6	788.6	789.2	0.6
O	17,465	450	2,380	1.9		788.7	788.7	789.5	0.8
P	17,315	470	2,094	2.2		788.9	788.9	789.8	0.9
Q	19,557	400	1,792	2.5		789.4	789.4	790.4	1.0
R	20,278	101	687	6.6		790.3	790.3	791.0	0.7
S	20,593	100	736	6.1		791.2	791.2	791.8	0.6
T	20,927	90	771	5.9		792.3	792.3	792.5	0.2
U	21,730	90	908	5.0		793.0	793.0	793.5	0.5
V	22,630	70	776	5.8		793.6	793.6	794.2	0.6
Q	23,223	100	942	4.8		794.0	794.0	794.8	0.8
X	23,437	105	1,030	4.4		794.7	794.7	795.2	0.5
Y	24,496	280	2,206	2.1		795.1	795.1	795.8	0.7
Z	25,579	320	2,001	2.3		795.2	795.2	796.0	0.8
AA	26,434	320	2,027	2.2		795.3	795.3	796.3	1.0

[1] FEET ABOVE CONFLUENCE WITH BLANCHARD RIVER

[2] ELEVATION COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM BLANCHARD RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

EAGLE CREEK

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AB	27,779	873	4,822	1.0		797.6	797.6	798.3	0.7
AC	28,940	422	2,494	1.9		798.0	798.0	798.8	0.8
AD	30,683	401	2,148	2.2		799.1	799.1	800.0	0.9
AE	31,158	488	2,517	1.9		799.6	799.6	800.5	0.9
AF	32,689	548	3,518	1.4		800.4	800.4	801.3	0.9
AG	34,748	318	2,092	2.3		801.3	801.3	802.2	0.9
AH	36,068	419	2,335	2.1		804.3	804.3	805.3	1.0
AI	37,177	197	1,386	3.2		805.8	805.8	806.7	0.9
AJ	37,336	327	2,199	2.0		806.8	806.8	807.8	1.0
AK	37,969	581	4,396	1.0		807.1	807.1	808.1	1.0
AL	38,972	330	2,578	1.7		807.6	807.6	808.6	1.0
AM	40,926	393	2,839	1.6		808.3	808.3	809.3	1.0
AN	41,771	408	2,208	2.0		808.8	808.8	809.8	1.0
AO	42,668	346	2,339	1.9		810.4	810.4	811.2	0.8
AP	44,622	396	1,533	2.9		812.3	812.3	813.0	0.7
AQ	45,467	217	1,024	4.4		815.2	815.2	815.6	0.4
AR	46,892	200	1,102	4.1		819.8	819.8	820.7	0.9
AS	48,265	309	1,594	2.5		822.7	822.7	823.5	0.8
AT	49,955	860	3,099	1.2		825.5	825.5	826.2	0.7
AU	52,014	471	2,386	1.4		827.1	827.1	827.4	0.3
AV	53,809	179	654	5.0		828.7	828.7	829.1	0.4
AW	54,496	832	1,744	1.9	631	831.1	831.1	832.0	0.9
AX	55,921	615	1,936	1.7		832.9	832.9	833.9	1.0
AY	56,555	583	1,298	2.5		833.7	833.7	834.7	1.0
AZ	58,033	231	1,201	2.7		837.5	837.5	838.5	1.0
BA	58,720	145	907	3.6		838.8	838.8	839.8	1.0
BB	59,248	589	2,322	1.4		840.0	840.0	841.0	1.0

[1] FEET ABOVE CONFLUENCE WITH BLANCHARD RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

EAGLE CREEK

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
BC	61,888	563	2,672	1.2		842.0	842.0	842.9	0.9
BD	63,313	508	2,852	1.1		844.3	844.3	845.1	0.8
BE	65,953	347	1,250	1.9		845.3	845.3	846.1	0.8
BF	70,652	373	1,703	1.4		852.2	852.2	853.2	1.0
BG	71,444	452	1,884	1.3		853.6	853.6	854.3	0.7
BH	72,553	155	748	3.2		854.7	854.7	855.5	0.8
BI	74,190	163	733	3.2		858.3	858.3	859.3	1.0
BJ	74,929	184	1,016	2.3		860.8	860.8	861.4	0.6

[1] FEET ABOVE CONFLUENCE WITH BLANCHARD RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

EAGLE CREEK

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1234	33	157	5.5		774.6	767.9 [2]	767.9	0.0
B	1445	48	217	4.0		774.6	767.2 [2]	769.3	0.1
C	1920	102	382	2.2		774.6	771.4 [2]	772.0	0.6
D	2501	42	179	4.8		774.6	772.8 [2]	773.1	0.3
E	2818	100	465	1.8		774.6	774.0 [2]	774.6	0.6
F	3240	101	328	2.6		774.6	774.3 [2]	774.9	0.6
G	3610	143	503	1.7		774.7	774.7	775.6	0.9
H	3874	161	685	1.3		775.5	775.5	776.2	0.7
I	4244	143	543	1.6		775.6	775.6	776.3	0.7
J	4613	108	343	2.5		776.0	776.0	776.6	0.6
K	4824	40	205	4.2		776.9	776.9	777.4	0.5
L	5141	83	291	3.4		777.7	777.7	778.3	0.6
M	5352	25	145	5.9		777.9	777.9	778.3	0.4
N	5669	205	526	1.6		779.9	779.9	780.4	0.5
O	6039	32	193	4.5		780.6	780.6	781.4	0.8
P	7095	25	168	5.1		783.0	783.0	783.6	0.6
Q	7887	18	133	6.5		784.0	784.0	784.6	0.6
R	8256	63	344	2.5		785.0	785.0	785.7	0.7
S	8573	30	158	5.4		785.6	785.3	786.0	0.7
T	9207	34	214	4.0		786.6	786.6	787.3	0.7
U	9735	40	240	3.6		787.6	787.6	788.2	0.6
V	9893	82	357	2.4		788.5	788.5	789.0	0.5
W	10157	46	209	4.1		788.6	788.6	789.2	0.6
X	10316	22	155	5.6		789.0	789.0	789.4	0.4
Y	10474	173	572	1.5		790.2	790.2	791.2	1.0
Z	10738	35	248	3.5		790.3	790.3	791.2	0.9
AA	11002	24	155	5.6		790.6	790.6	791.4	0.8

[1] FEET ABOVE CONFLUENCE WITH BLANCHARD RIVER

[2] ELEVATION COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM BLANCHARD RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

HOWARD RUN

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AB	11213	23	146	5.9		791.7	791.7	792.2	0.5
AC	12005	125	591	1.5		792.9	792.6	793.5	0.9
AD	12619	126	445	1.9		793.4	793.4	794.2	0.8
AE	12830	27	196	4.4		793.9	793.9	794.9	1.0
AF	12517	207	780	1.1		795.0	795.0	795.9	0.9
AG	13939	32	222	3.9		795.1	795.1	796.0	0.9

[1] FEET ABOVE CONFLUENCE WITH BLANCHARD RIVER

[2] ELEVATION COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM BLANCHARD RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

HOWARD RUN

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	4,028	100	439	4.4		778.5	774.0 [2]	774.8	0.8
B	4,986	120	660	2.9		778.5	775.0 [2]	775.9	0.9
C	5,998	100	482	3.9		778.5	776.2 [2]	776.8	0.6
D	7,085	100	612	3.1		778.5	776.7 [2]	777.5	0.8
E	7,880	110	544	3.5		778.5	777.1 [2]	778.0	0.9
F	8,565	80	464	4.1		778.5	777.4 [2]	778.4	1.0
G	8917	80	487	3.9		778.5	777.8 [2]	778.7	0.9
H	9349	90	545	3.5		778.5	778.3 [2]	779.2	0.9
I	9545	90	475	4.0		778.6	778.6	779.3	0.7
J	10180	100	518	3.6		779.0	779.0	779.9	0.9
K	10465	120	585	3.2		779.4	779.4	780.2	0.8
L	10801	10	403	4.7		779.7	779.7	780.4	0.7
M	11828	80	332	5.7		781.2	781.2	782.2	1.0
N	12120	210	1,047	1.9		783.6	783.6	784.6	1.0
O	13017	387	1,771	1.1		784.4	784.4	785.4	1.0
P	13651	536	2,437	0.8		784.8	784.8	785.8	1.0
Q	15076	502	2,395	0.8		785.2	785.2	786.2	1.0
R	16555	364	1,805	1.1		785.7	785.7	786.7	1.0
S	17980	639	2,039	1.0	220	786.5	786.5	787.5	1.0

[1] FEET ABOVE CONFLUENCE WITH BLANCHARD RIVER

[2] ELEVATION COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM BLANCHARD RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

LYE CREEK

FLOODING SOURCE		FLOODWAY				1%-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2112	90	309	2.7		781.1	777.3 [2]	777.7	0.4
B	2640	49	242	3.5		781.1	778.3 [2]	778.9	0.6
C	3221	22	108	7.8		781.1	779.2 [2]	779.9	0.7
D	3696	20	117	7.2		782.5	782.5	783.2	0.7
E	3854	50	340	2.5		784.2	784.2	785.0	0.8
F	4066	79	375	2.2		784.3	784.3	785.1	0.8
G	4277	26	127	6.6		784.5	784.5	785.5	1.0
H	4382	85	323	2.6		785.9	785.9	786.7	0.8
I	4541	105	494	1.7		786.6	786.6	787.5	0.9
J	4646	39	207	4.1		786.9	786.9	787.8	0.9
K	4805	66	276	3.0		787.5	787.5	788.4	0.9

[1] FEET ABOVE CONFLUENCE WITH BLANCHARD RIVER

[2] ELEVATION COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM BLANCHARD RIVER

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

FLOODWAY DATA

RUSH CREEK

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, and to areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile (sq. mi.), and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The countywide FIRM presents flooding information for the entire geographic area of Hancock County except for areas located within the Village of Bluffton. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard

information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community are presented in Table 6, “Community Map History.”

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Arcadia, Village of	July 11, 1975	None	March 1, 1987	None
Arlington, Village of	June 2, 2011	None	June 2, 2011	None
Benton Ridge, Village of	August 9, 1974	April 23, 1976	November 23, 1984	None
Findlay, City of	January 23, 1974	May 21, 1976	December 4, 1984	April 5, 1988 September 20,2006
Fostoria, City of (Dual County Community) (Wood County) (Seneca County)	April 12, 1974	April 16, 1976 June 22, 1979	July 1, 1987	None
Hancock County (Unincorporated Areas)	December 30, 1977	None	August 5, 1991	None
Jenera, Village of	August 9, 1974	May 21, 1976	May 1, 2008	None
*McComb, Village of	N/A	None	N/A	None
Mount Blanchard, Village of	August 9, 1974	May 21, 1976	February 5, 1986	None

*No Special Flood Hazard Areas Identified

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
*Mount Cory, Village of	N/A	None	N/A	None
*Rawson, Village of	N/A	None	N/A	None
Van Buren, Village of	March 22, 1974	June 18, 1976	June 2, 2011	None
*Vanlue, Village of	N/A	None	N/A	None

*No Special Flood Hazard Areas Identified

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

This FIS report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting Federal Insurance and Mitigation Division, FEMA Region V, 536 South Clark Street, Sixth Floor, Chicago, IL 60605.

9.0 REFERENCES AND BIBLIOGRAPHY

1. Federal Emergency Management Agency. (1986). Flood Insurance Study, Village of Mount Blanchard. Hancock County, Ohio.

2. Federal Emergency Management Agency. (2006). Flood Insurance Study, City of Findlay. Hancock County, Ohio.

3. Federal Emergency Management Agency. (1991). Flood Insurance Study, Hancock County Unincorporated Areas, Hancock County, Ohio.

4. U.S. Department of Commerce, Bureau of the Census. (1980, 1990 and 2000). Census of Population, Ohio. Washington, D.C., April 2000.

5. Environmental Sciences Services Administration, Climatological Surrmary, Findlay, Ohio, 1967.

6. U.S. Department of Agriculture, Soil Conservation Service, Soil Conservation Service, Soil Survey of Hancock County, Ohio, Washington, D.C., February 1982

7. Ohio Department of Natural Resources, Division of Water, Gazetteer of Ohio Streams, Ohio Water Plan Inventory Report No. 12a, 1960.

8. Ohio Department of Natural Resources, Division Water, Drainage Areas of Ohio Streams, Supplement to Gazetteer of Ohio Streams, Ohio Water Plan Inventory Report No. 12a, 1967.

9. U. S. Geological Survey, Preliminary Data for Open-File Report on June 1981 Flood on Blanchard River, 1981.

10. Findlay Courier, June 17, 1981.

11. Ohio Department of Natural Resources, Division of Water, Preliminary Reports of Floods in Ohio, January 1959 and February 1959, 1959.

12. National Oceanic and Atmospheric Administration, National Climatic Data Center, Storm Events, Fulton, Ohio, 2008.

13. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Code of Federal Regulations, Title 24, Chapter 10, Parts 1910.3A and 3B, Federal Register, Volume 41, No. 207, revision 1976.

14. Ohio Department of Natural Resources, Division of Water, Bulletin No. 45, Floods in Ohio, Magnitude and Frequency, E.E. Weber and W.P. Barlett, Jr., May 1972.

15. U. S. Department of Agriculture, Soil Conservation Service, Flood Plain Management Study: The Blanchard River and Riley Creek-Allen, Putnam, Hancock, and Hardin Counties, Ohio, December 1987, corrected August 1988, revised July 1990.

16. Koltun, G.F., and Roberts, J.W., U.S. Geological Survey, Techniques for Estimating Flood-Peak Discharges of Rural, Unregulated Streams in Ohio, Water-Resources Investigations Report 89-4126, March 1990.

17. U. S. Department of the Interior, Geological Survey, Interagency Advisory Committee on Water Data, Office of Water Data Coordination, Hydrology Subcommittee, Bulletin No. 17B, Guidelines for Determining Flood Flow Frequency, September 1981, revised March 1982.

18. U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 55, Urban Hydrology for Small Watersheds, January 1975.

19. ESRI. (2008). ArcGIS v.9.2. Redlands, California.

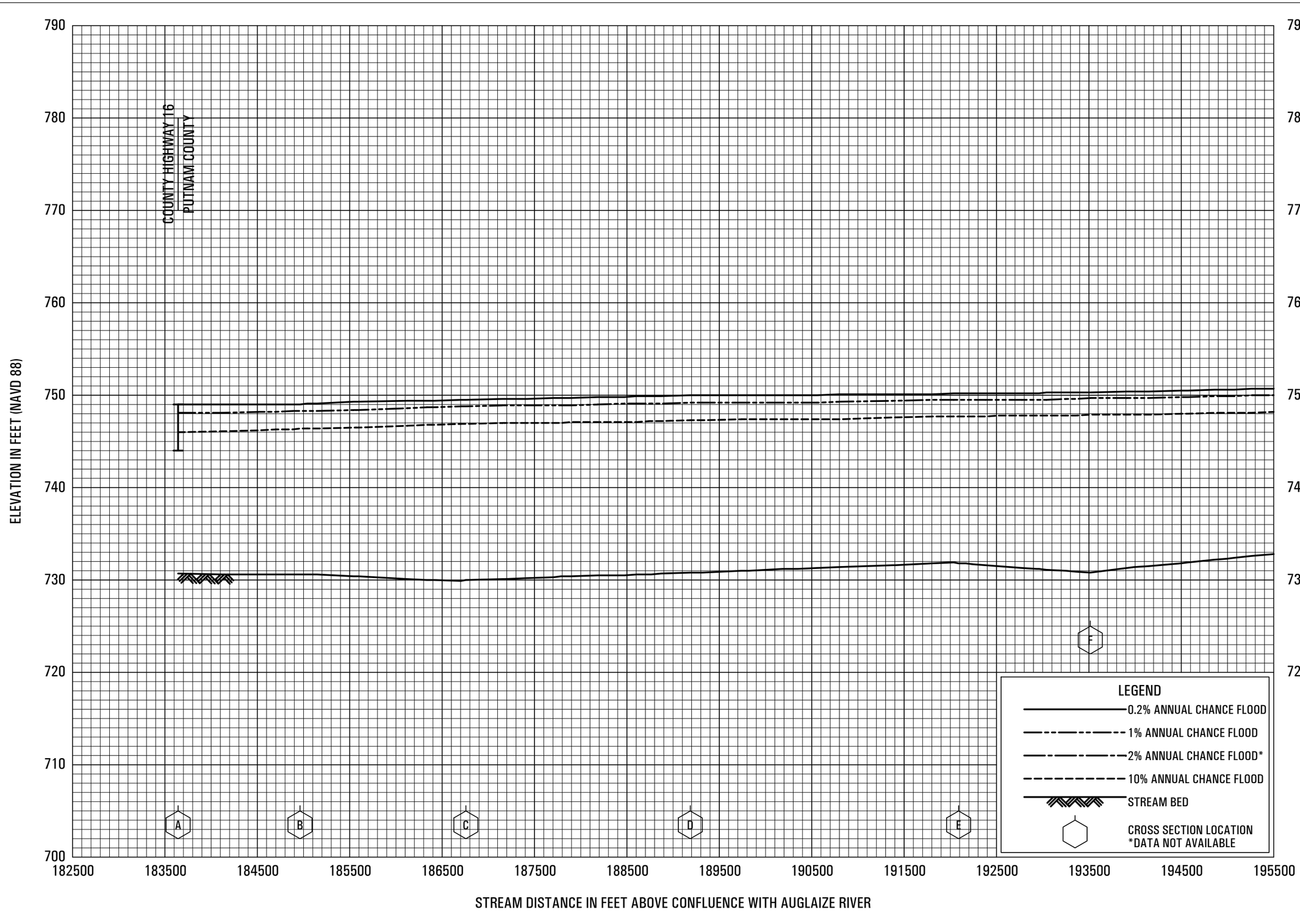
20. U.S. Army Corps of Engineers Hydrologic Engineering Center. (2008). HEC-RAS River Analysis System. Davis, California.

21. Woolpert Consultants, Aerial Photography, Scale 1:9600, April 1983.

22. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Computer Program 723-X6=L202A, Davis, California, December 1968, with updates.

23. U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 61, WSP-2 Computer Program, May 1976.

24. MAN Mapping Services, Inc., GIS Topographic Map Layer for the City of Findlay, Contour Interval 2 feet, Columbus, Ohio, 1999.



FLOOD PROFILES

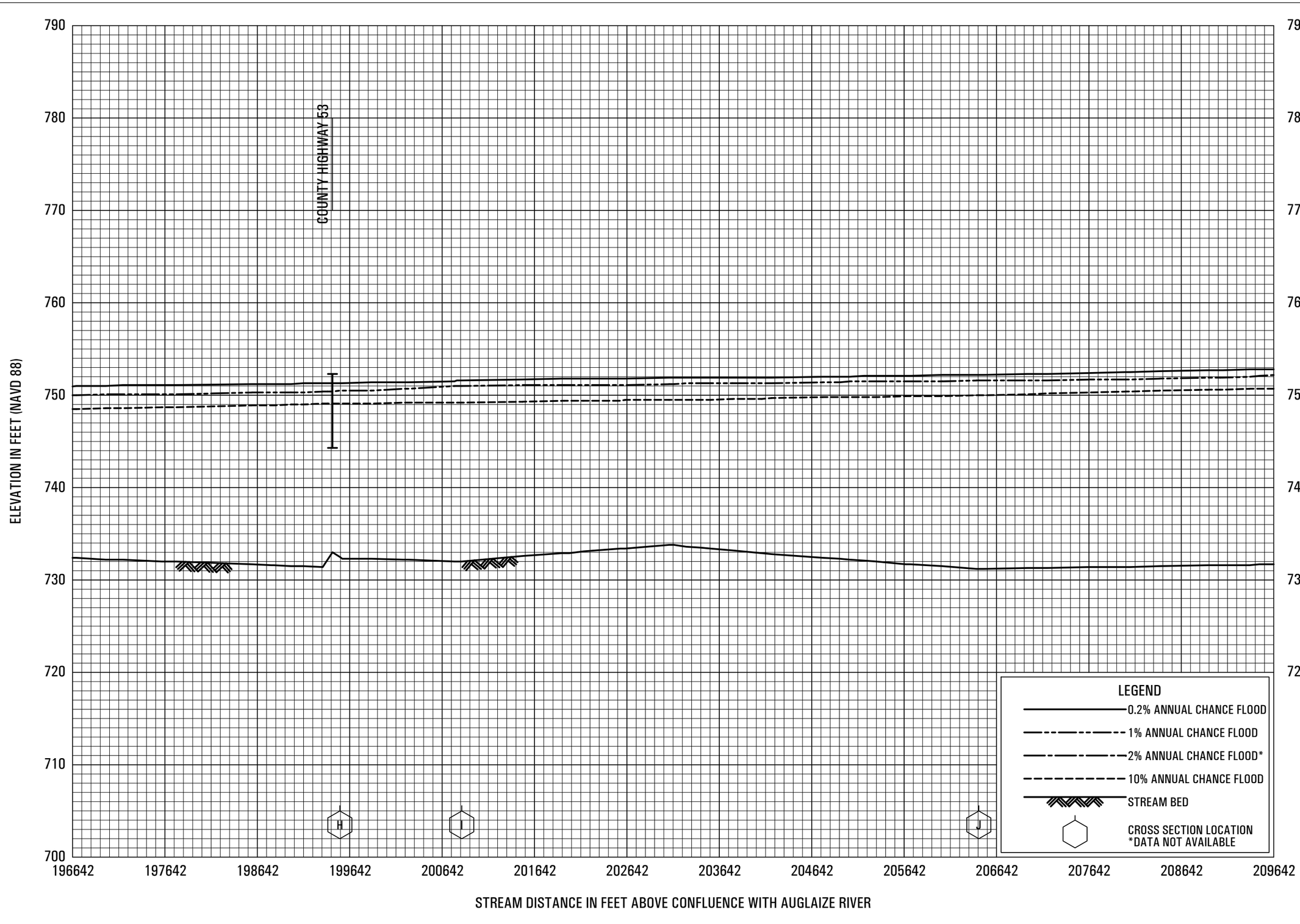
BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

01P



FLOOD PROFILES

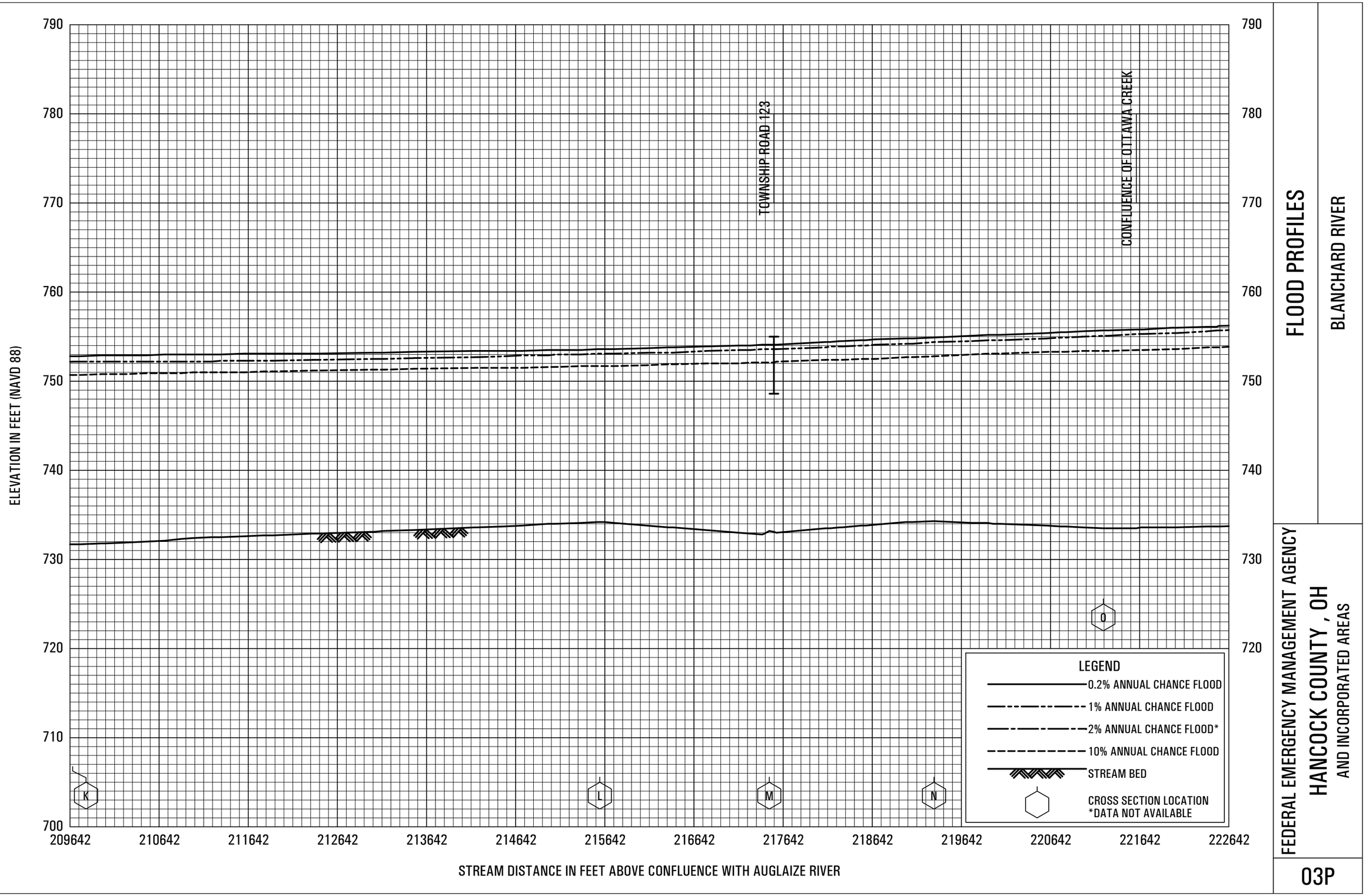
BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

02P



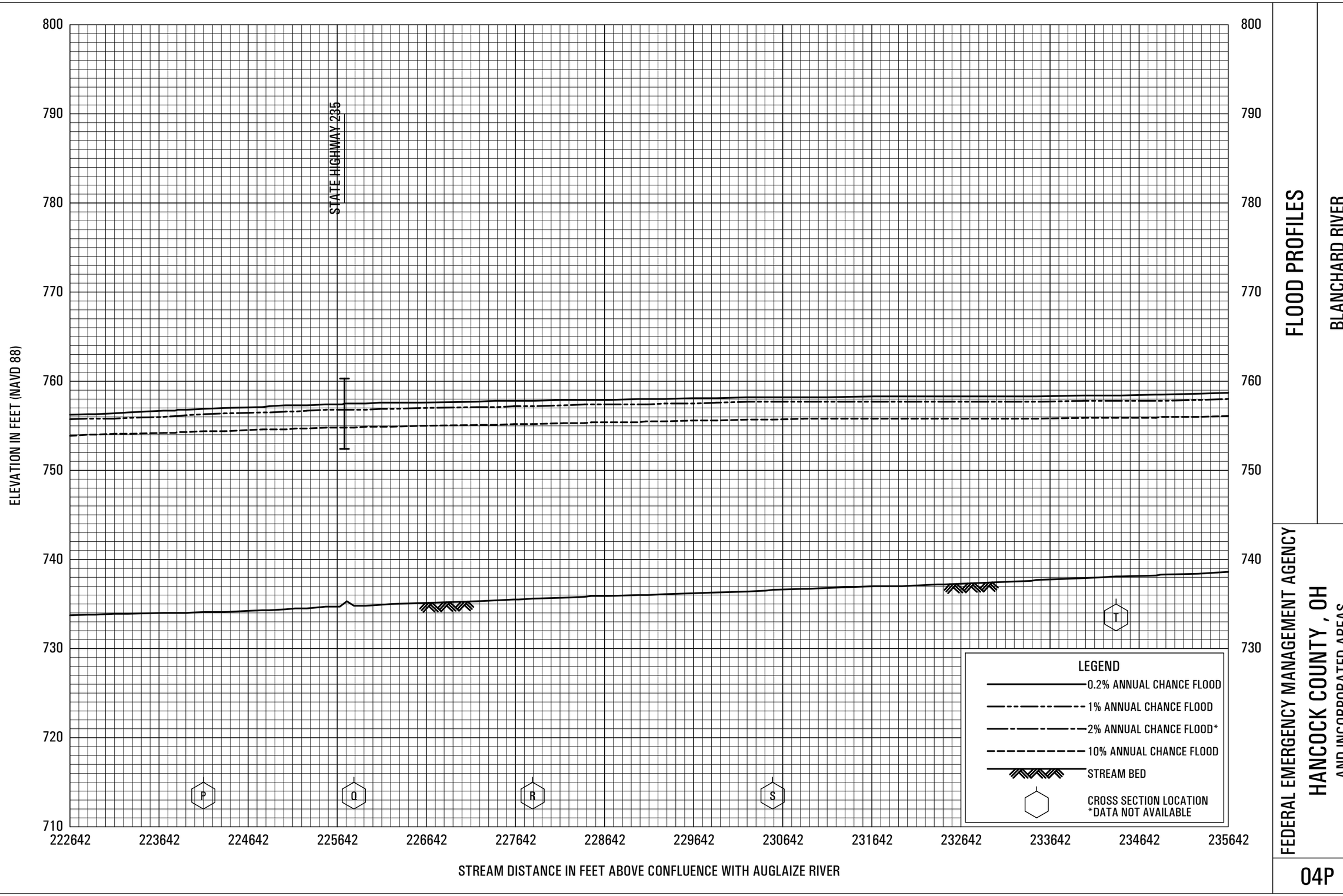
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



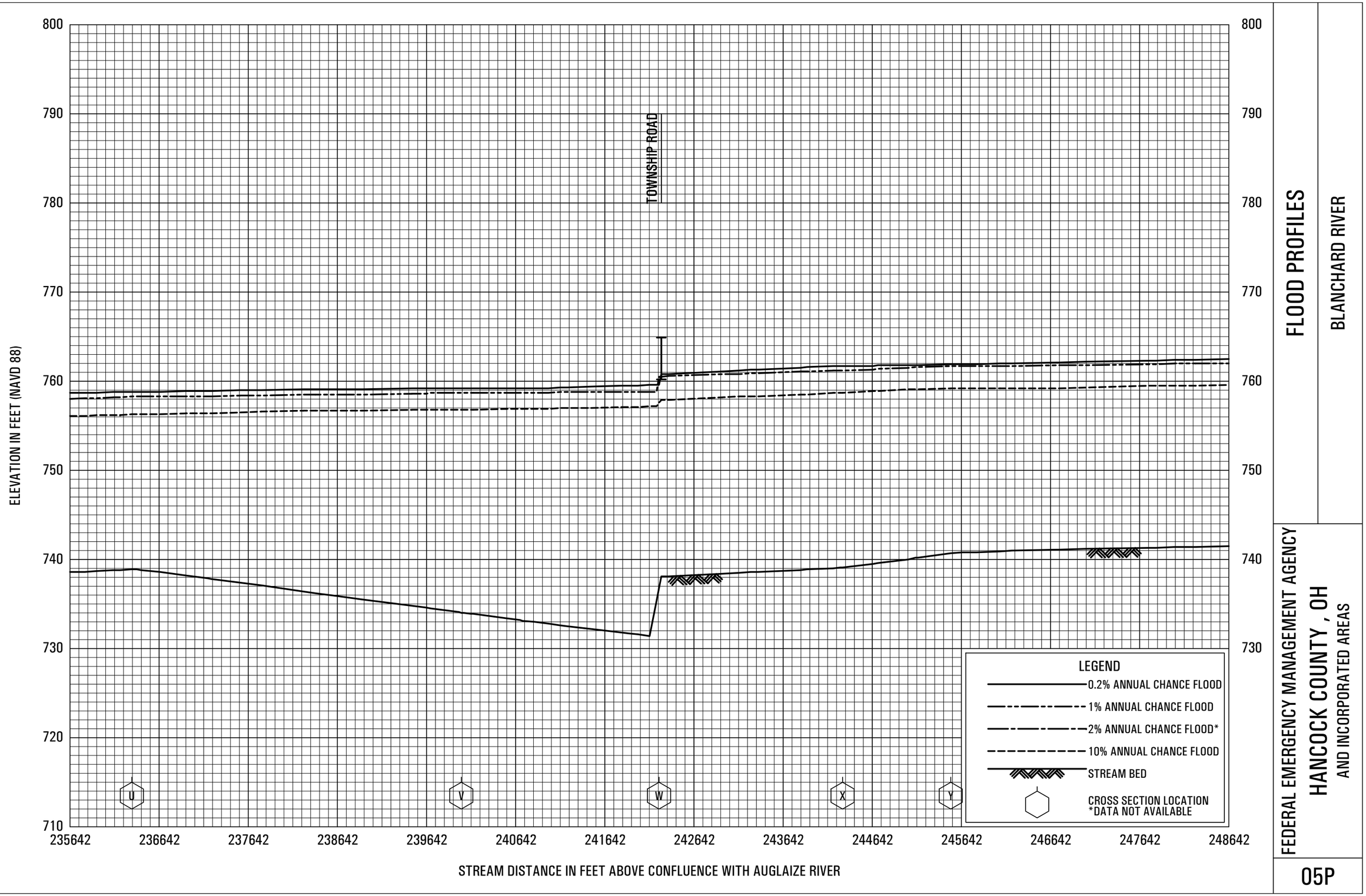
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

04P



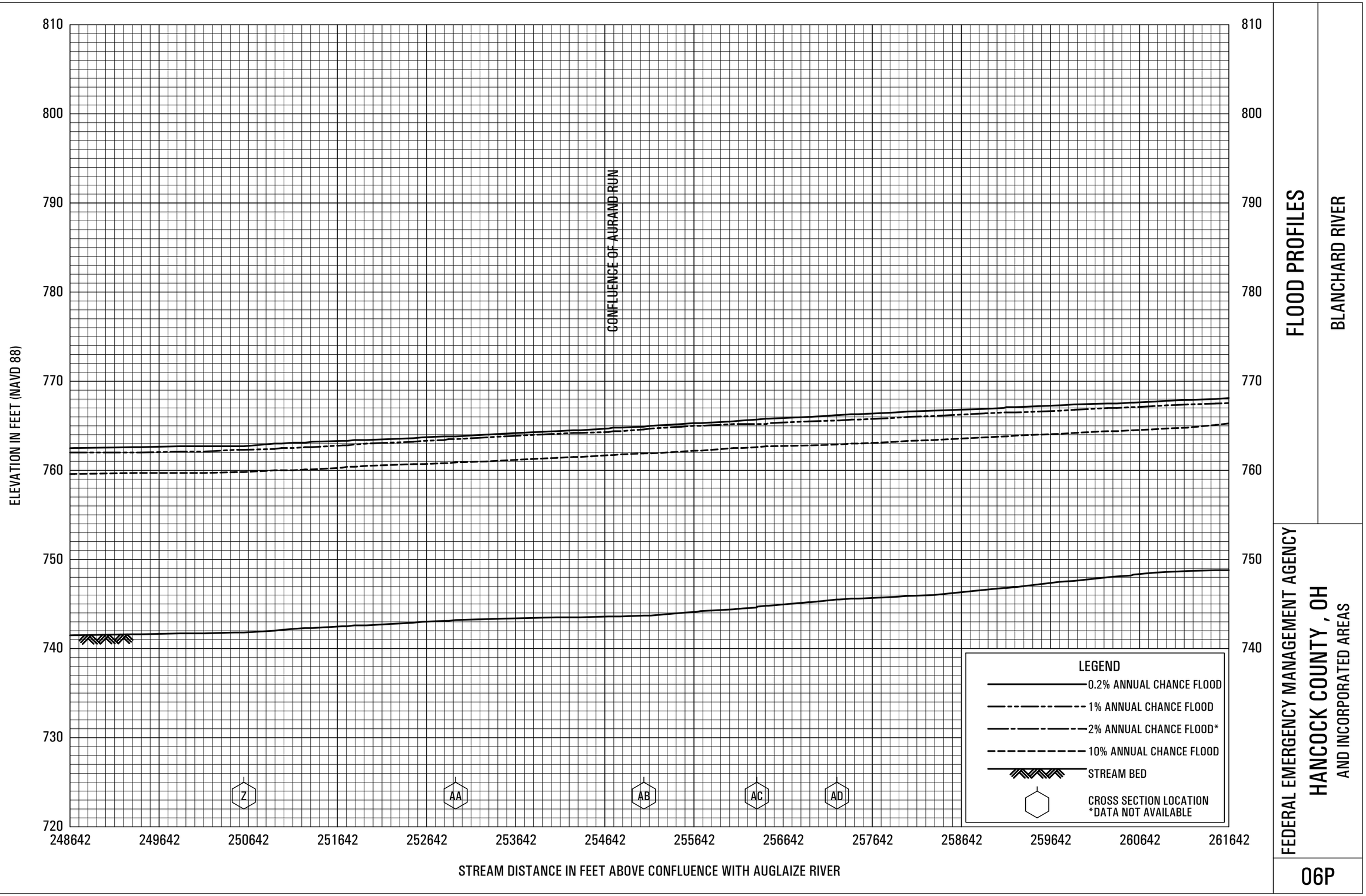
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



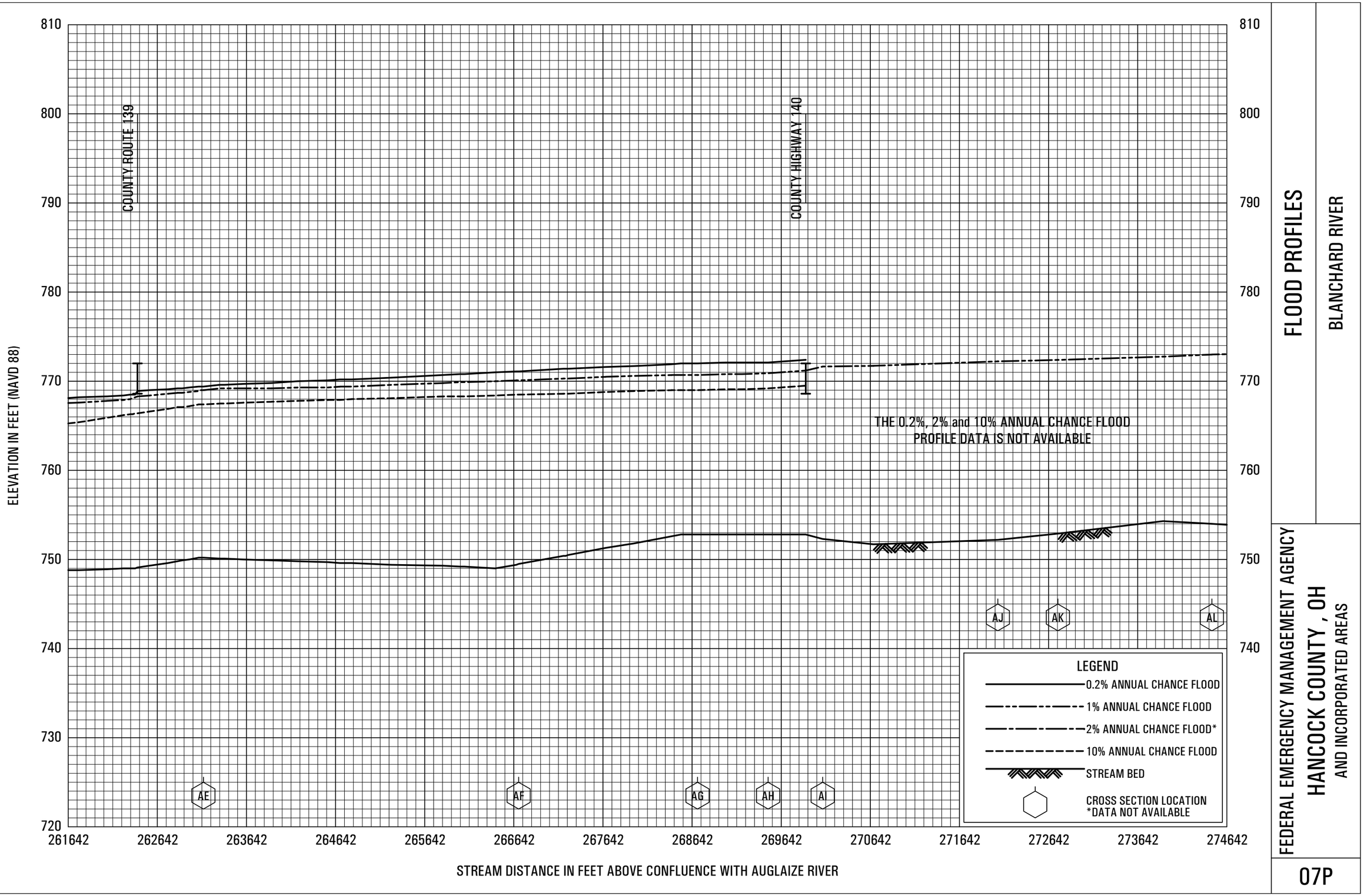
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

06P



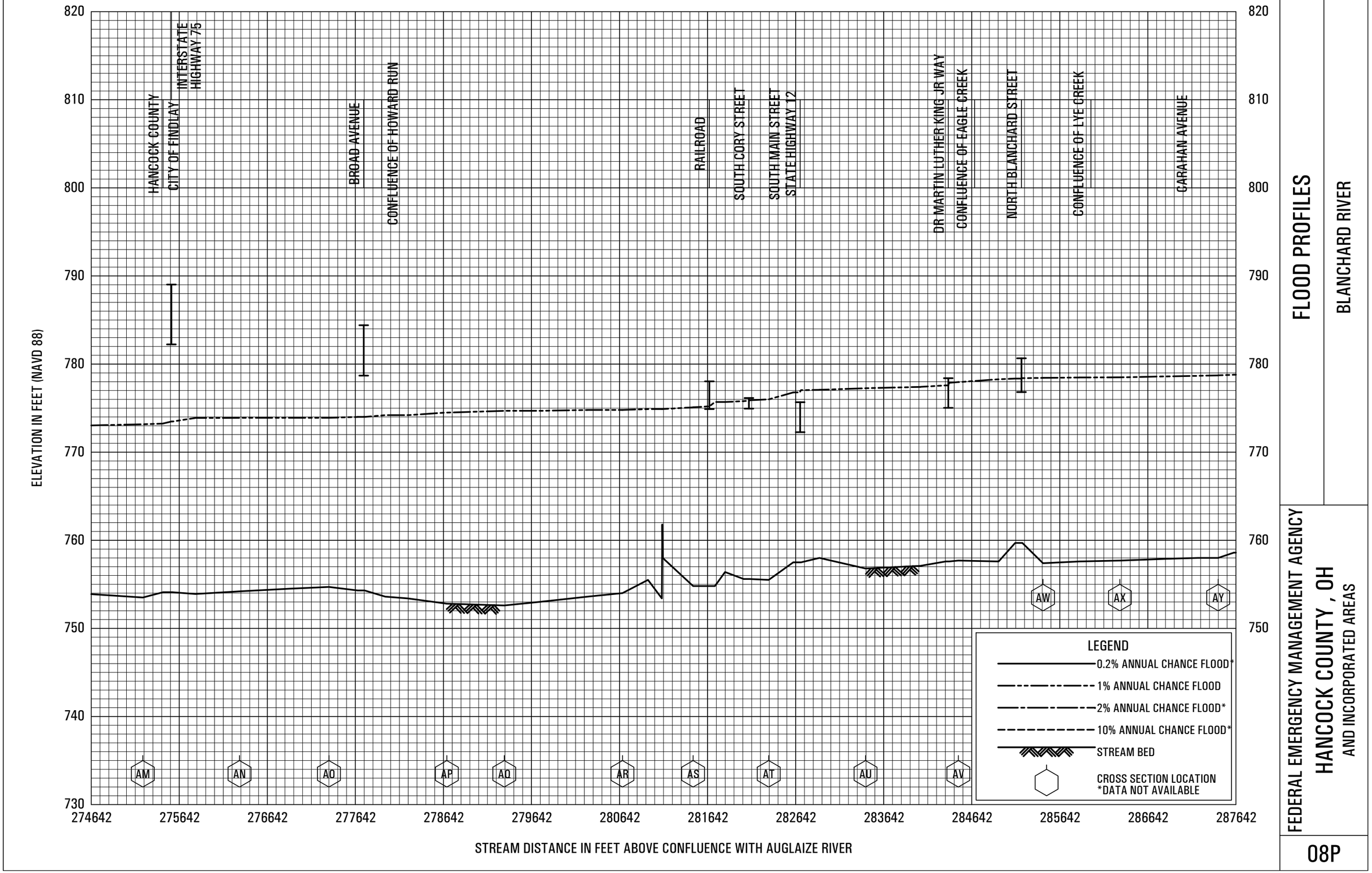
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



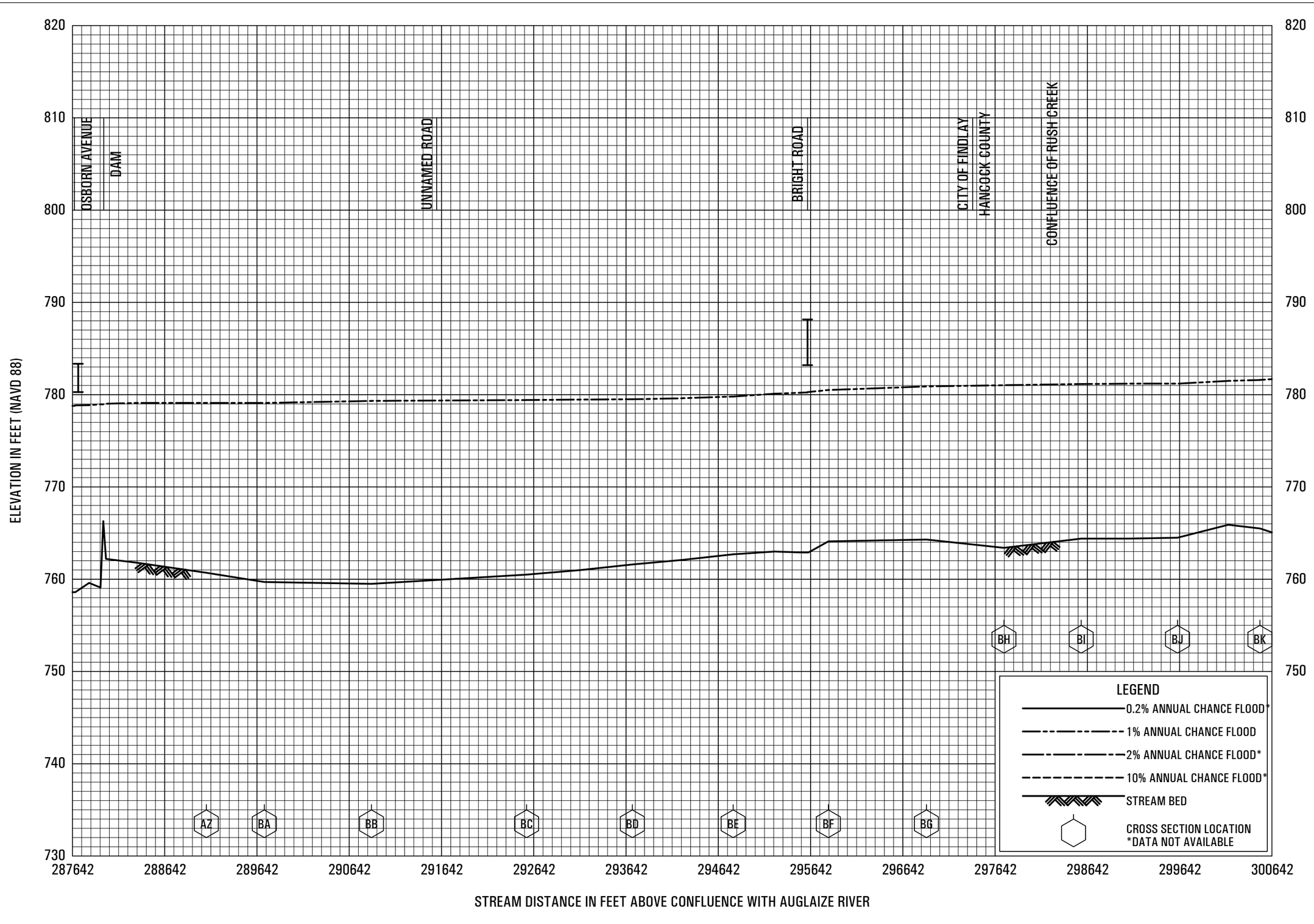
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



FLOOD PROFILES

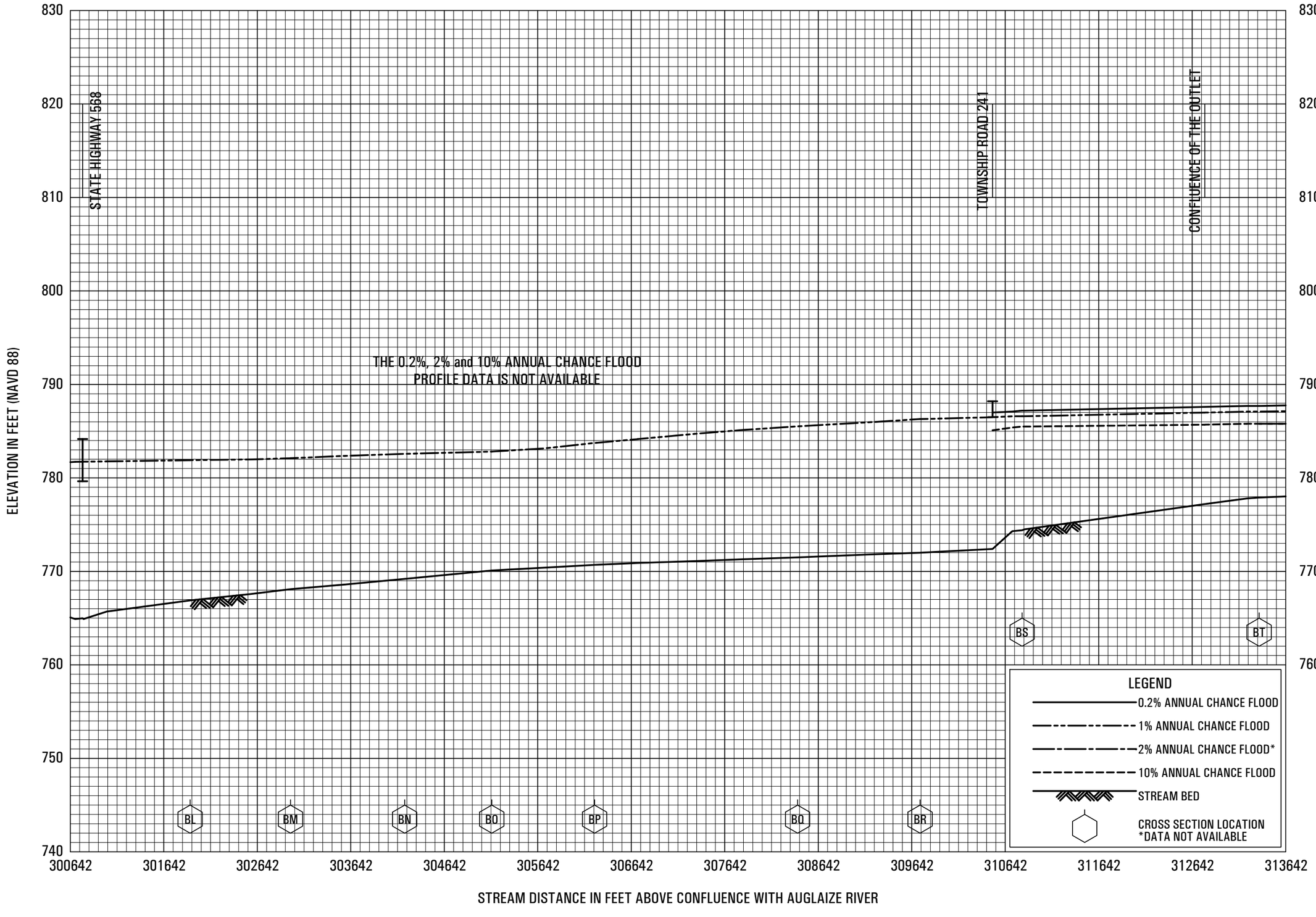
BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

09P



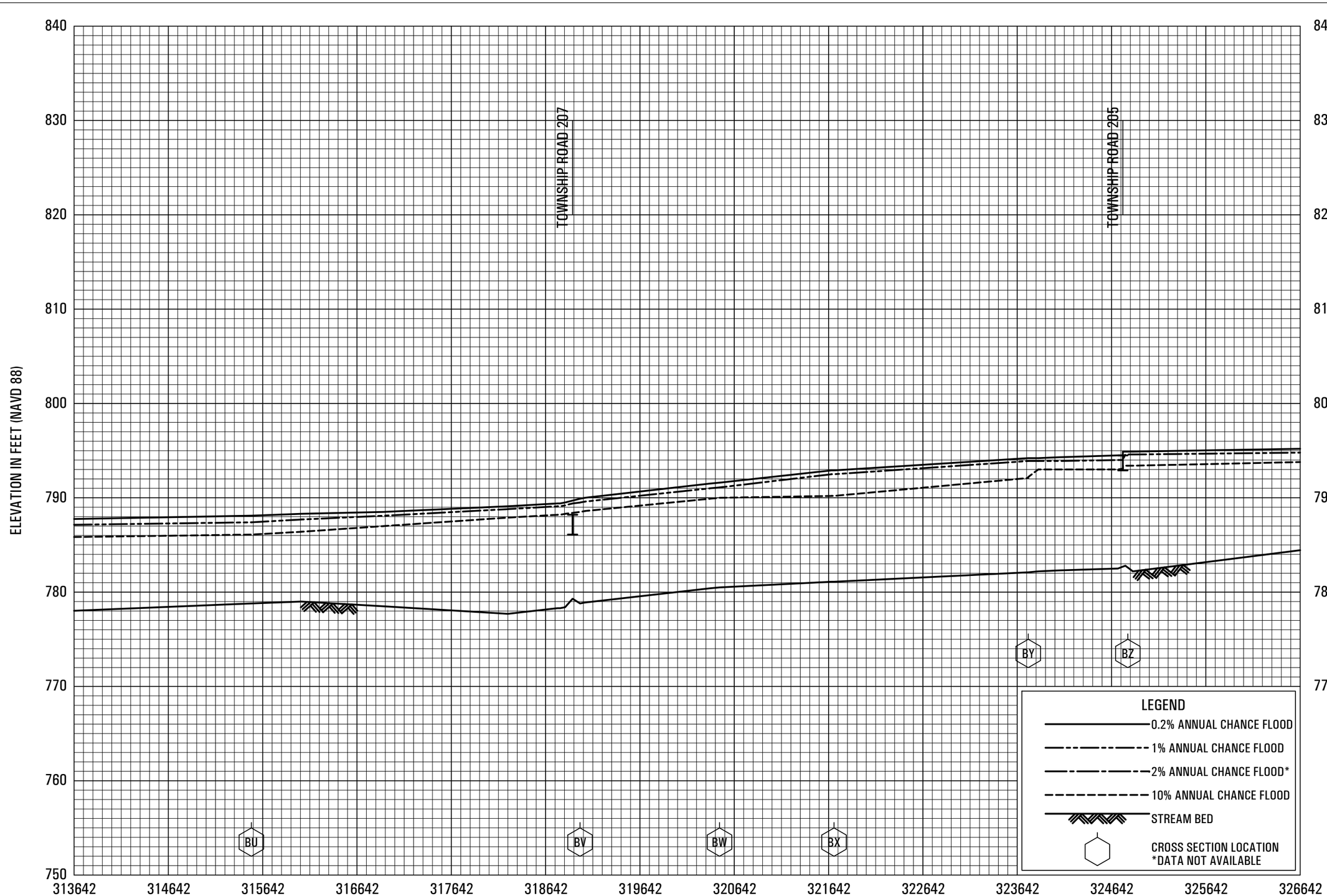
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

10P



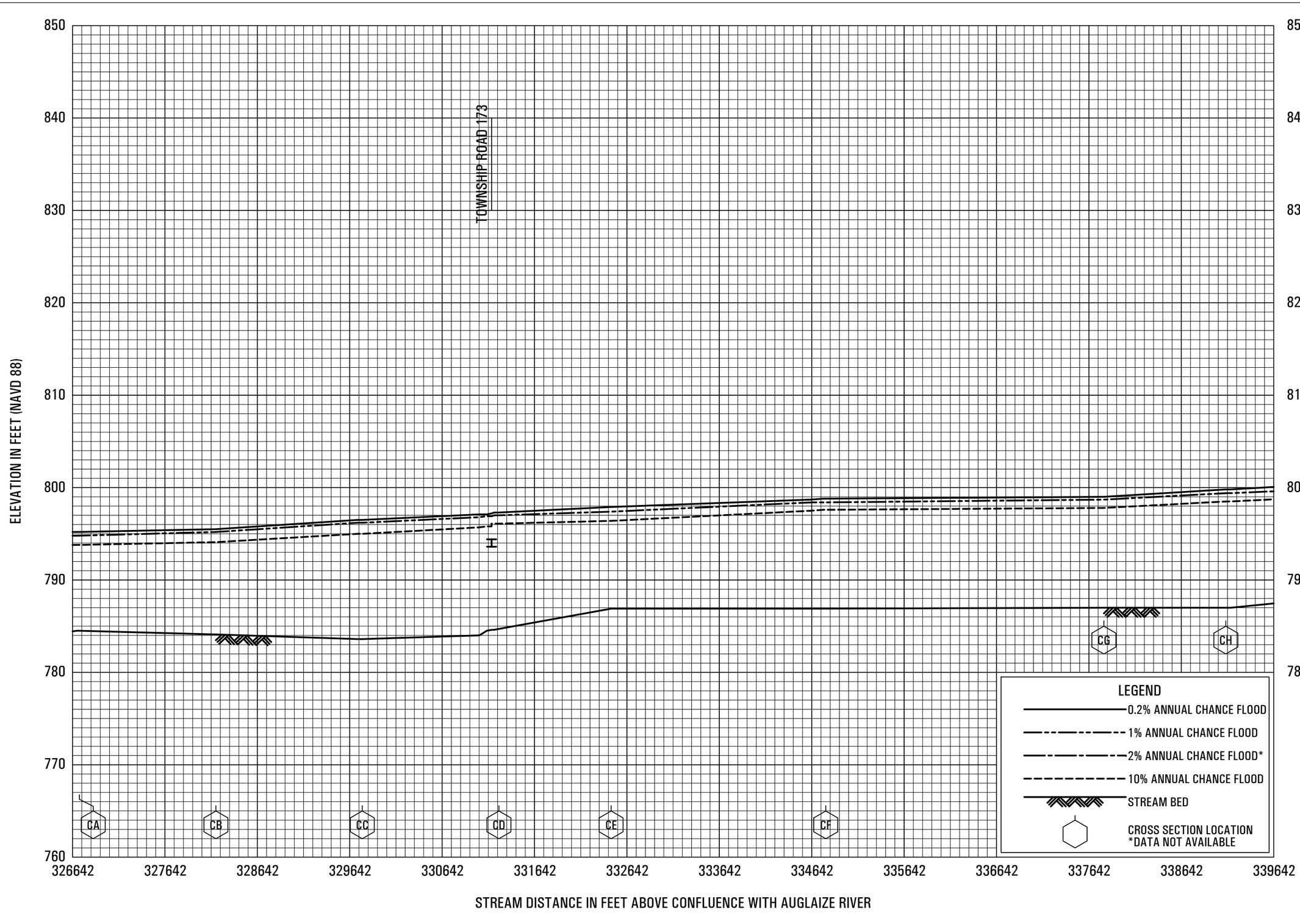
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



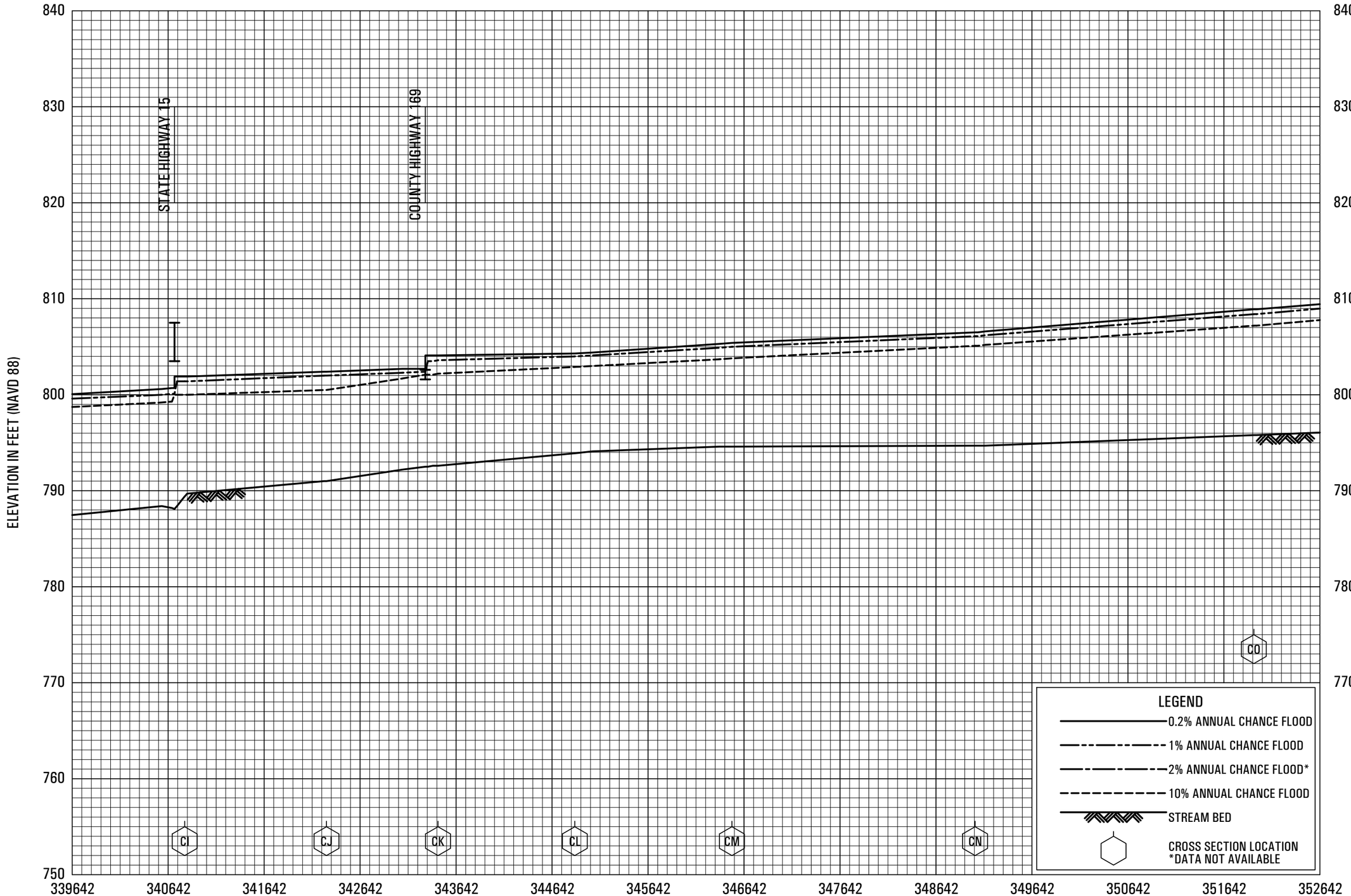
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

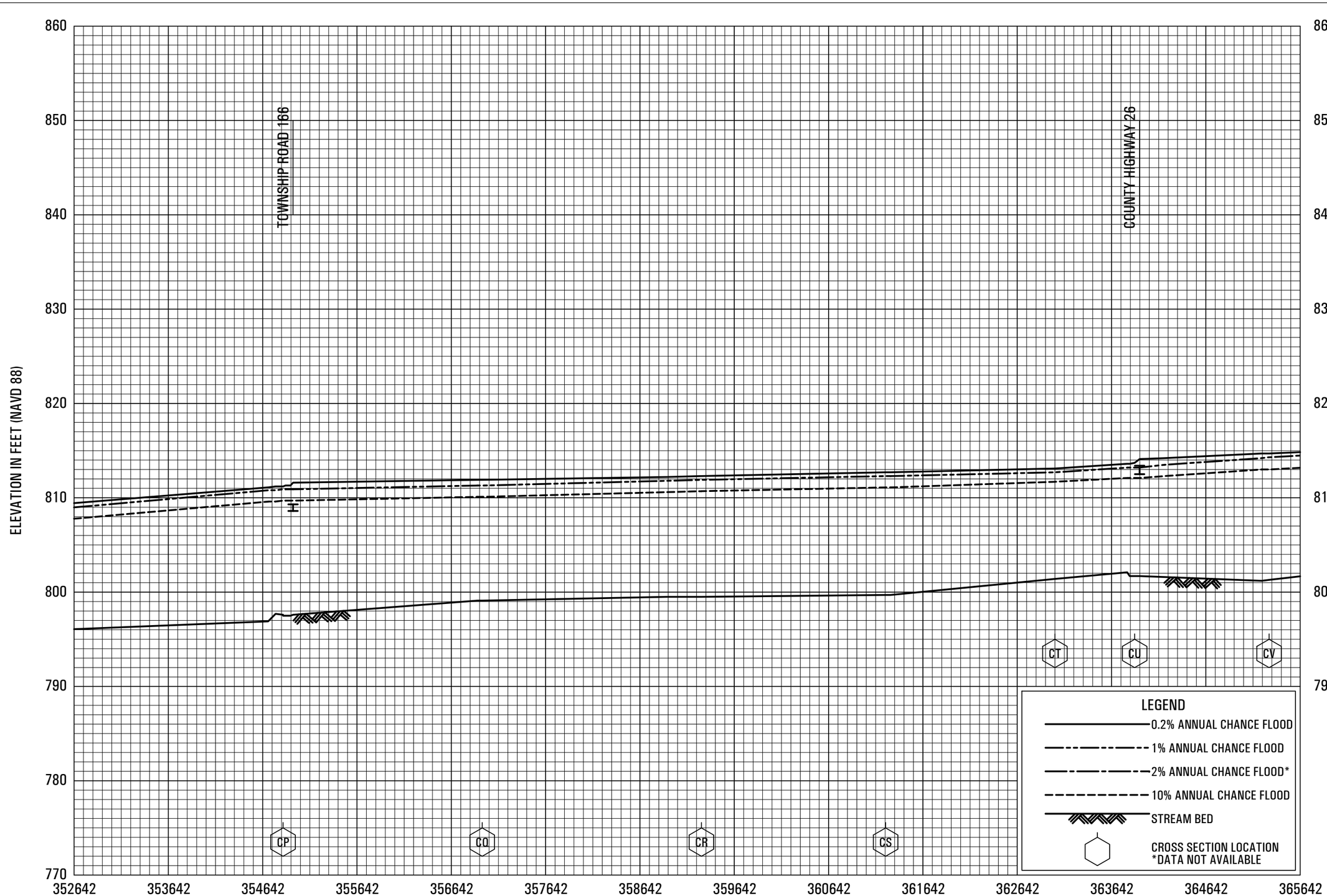


FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS



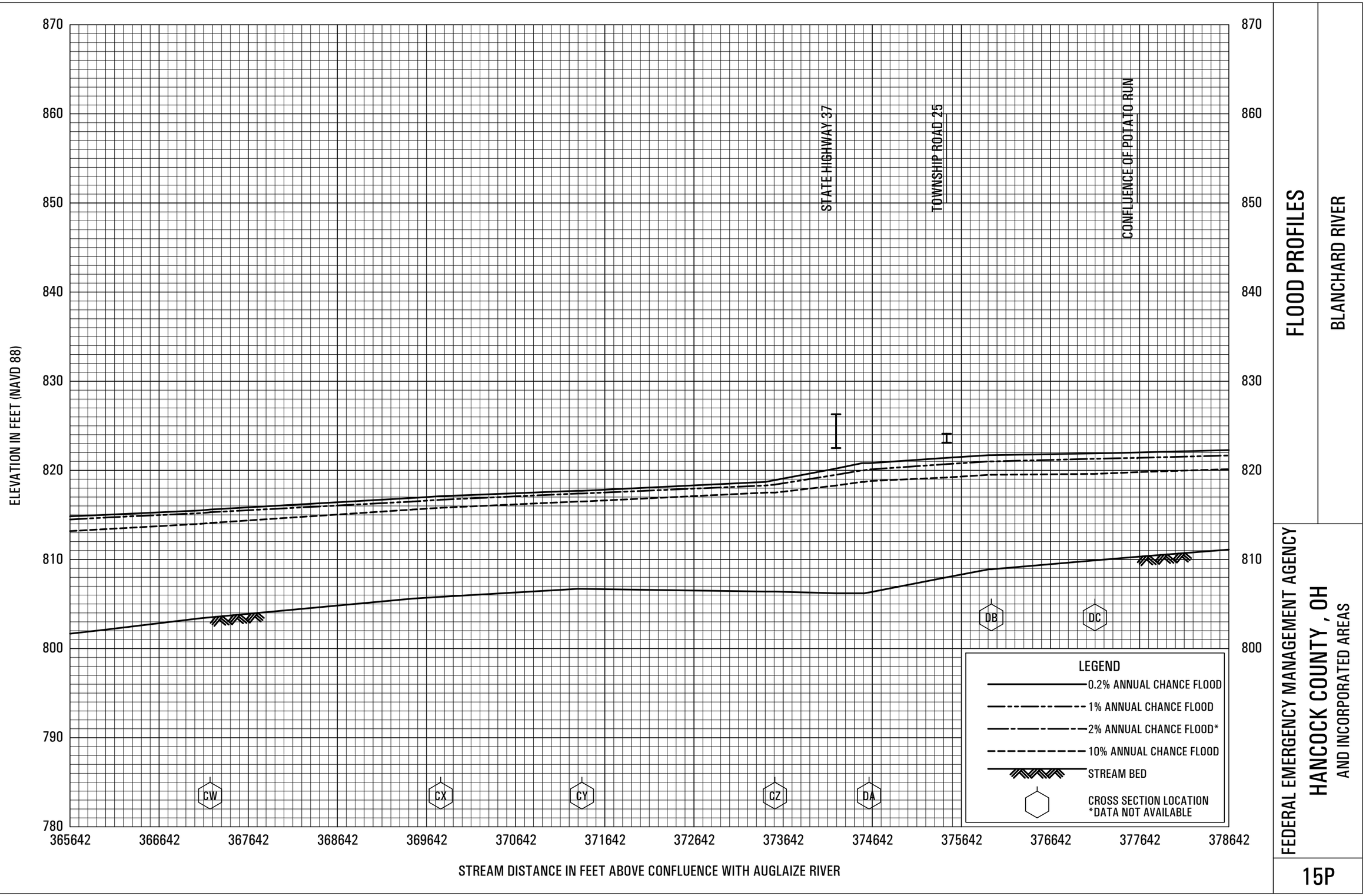
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



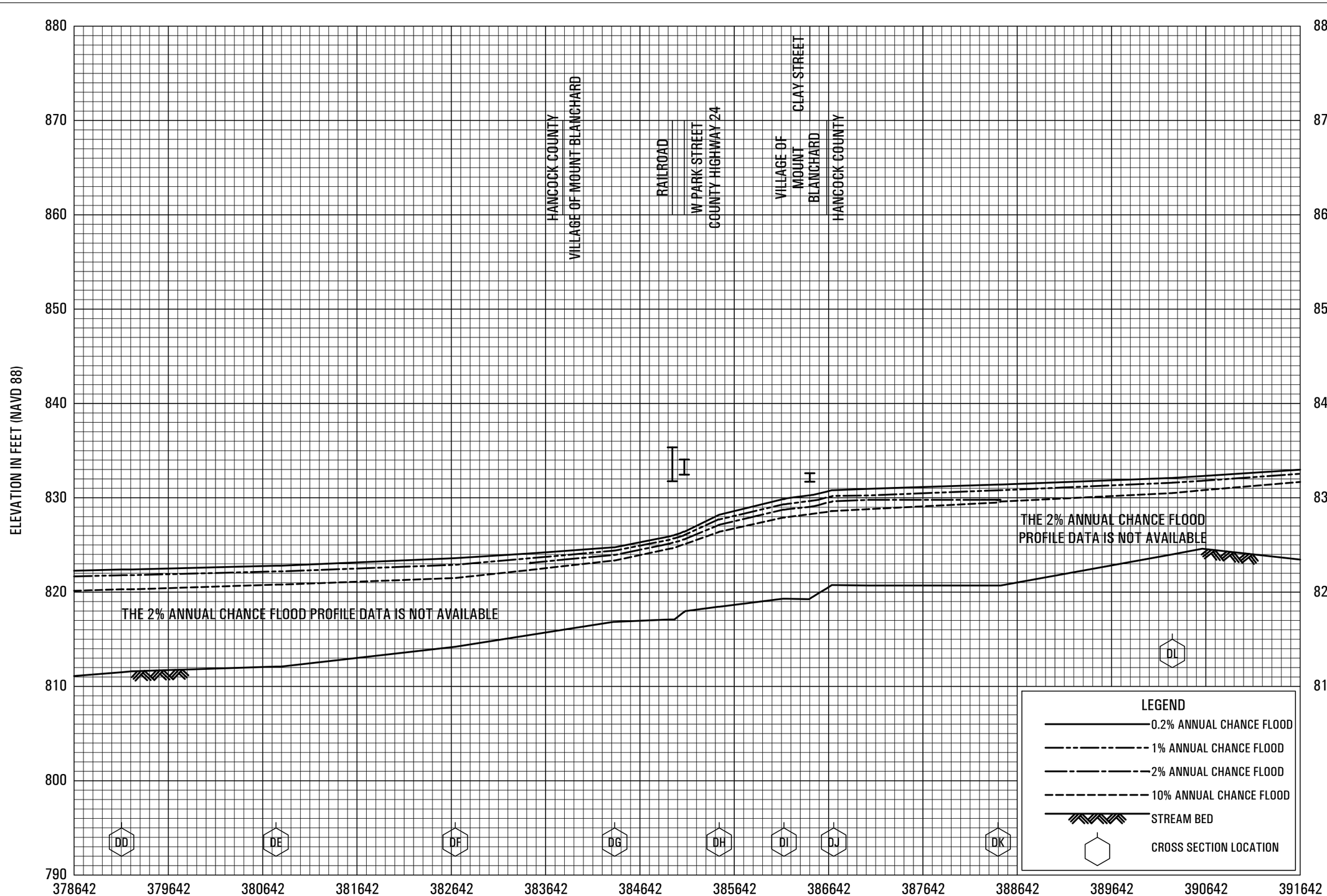
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



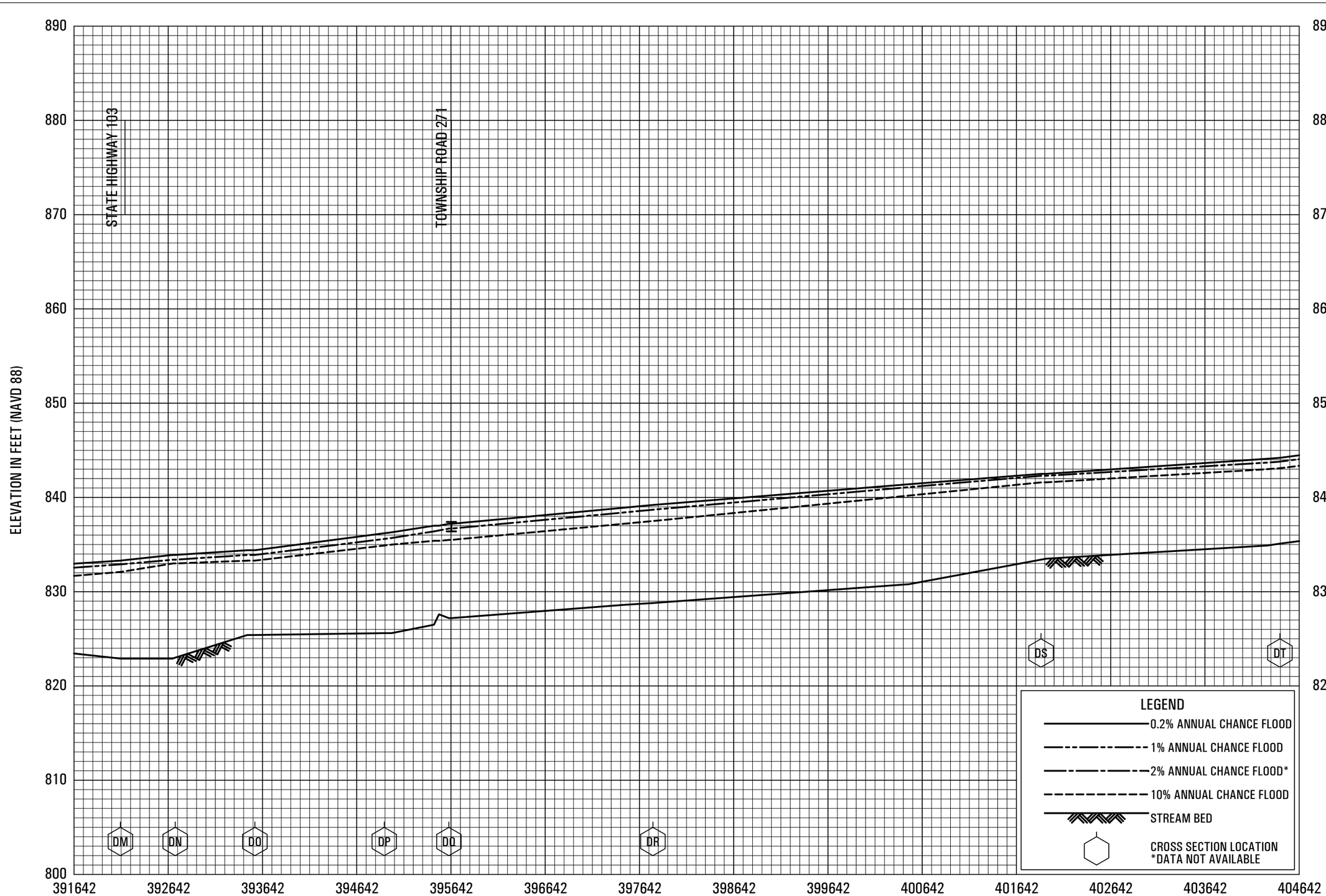
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



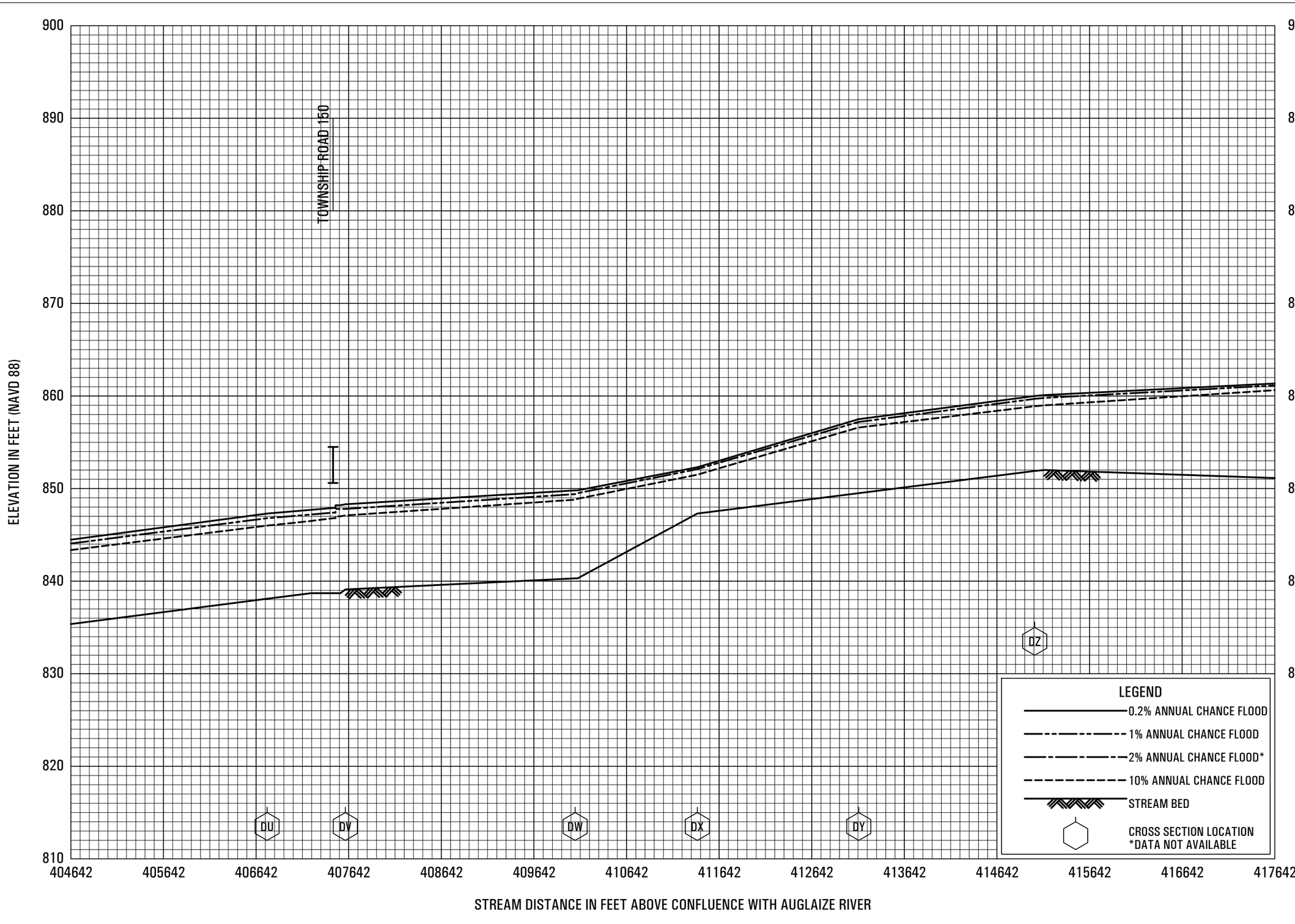
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS

17P



FLOOD PROFILES

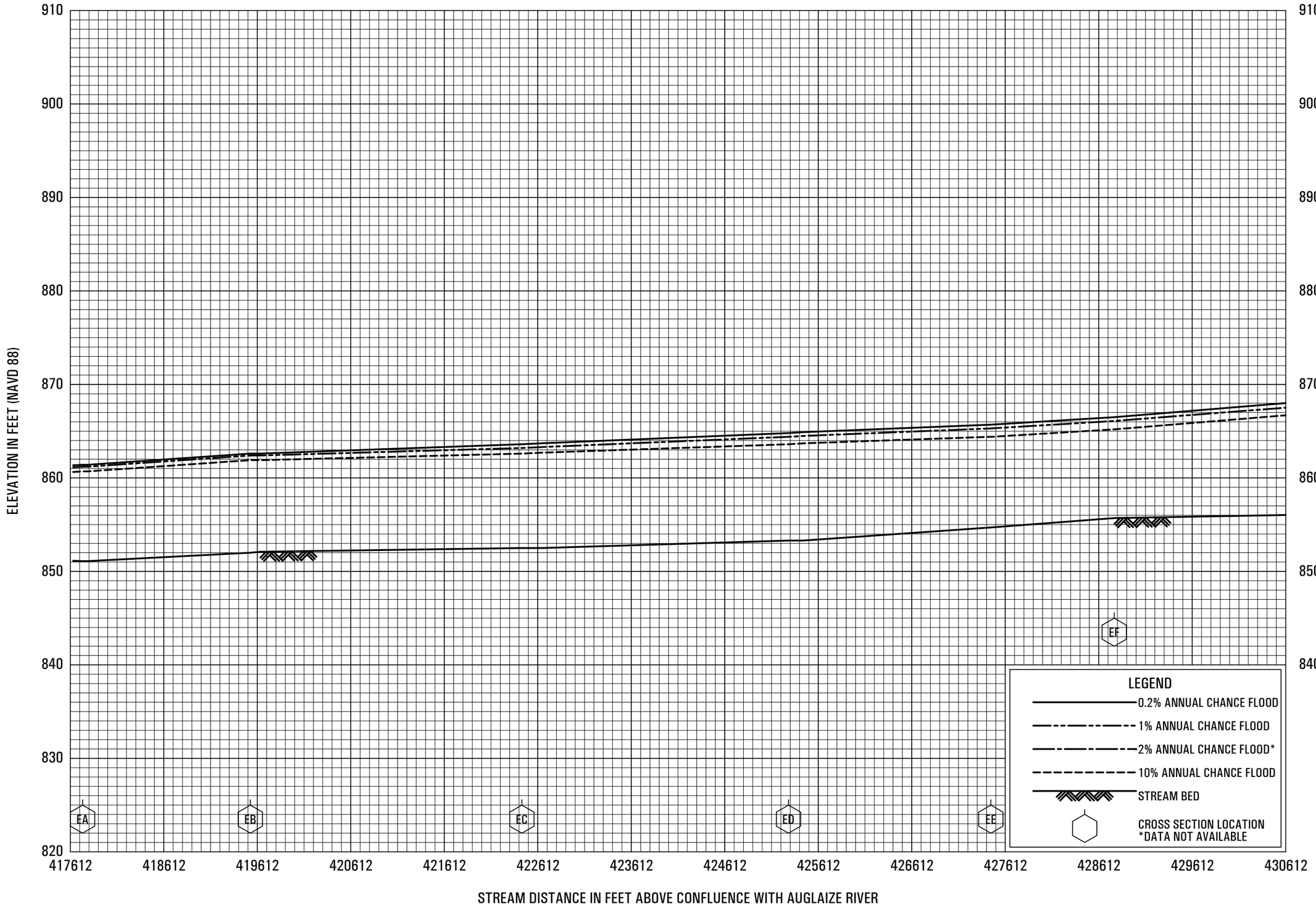
BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

18P

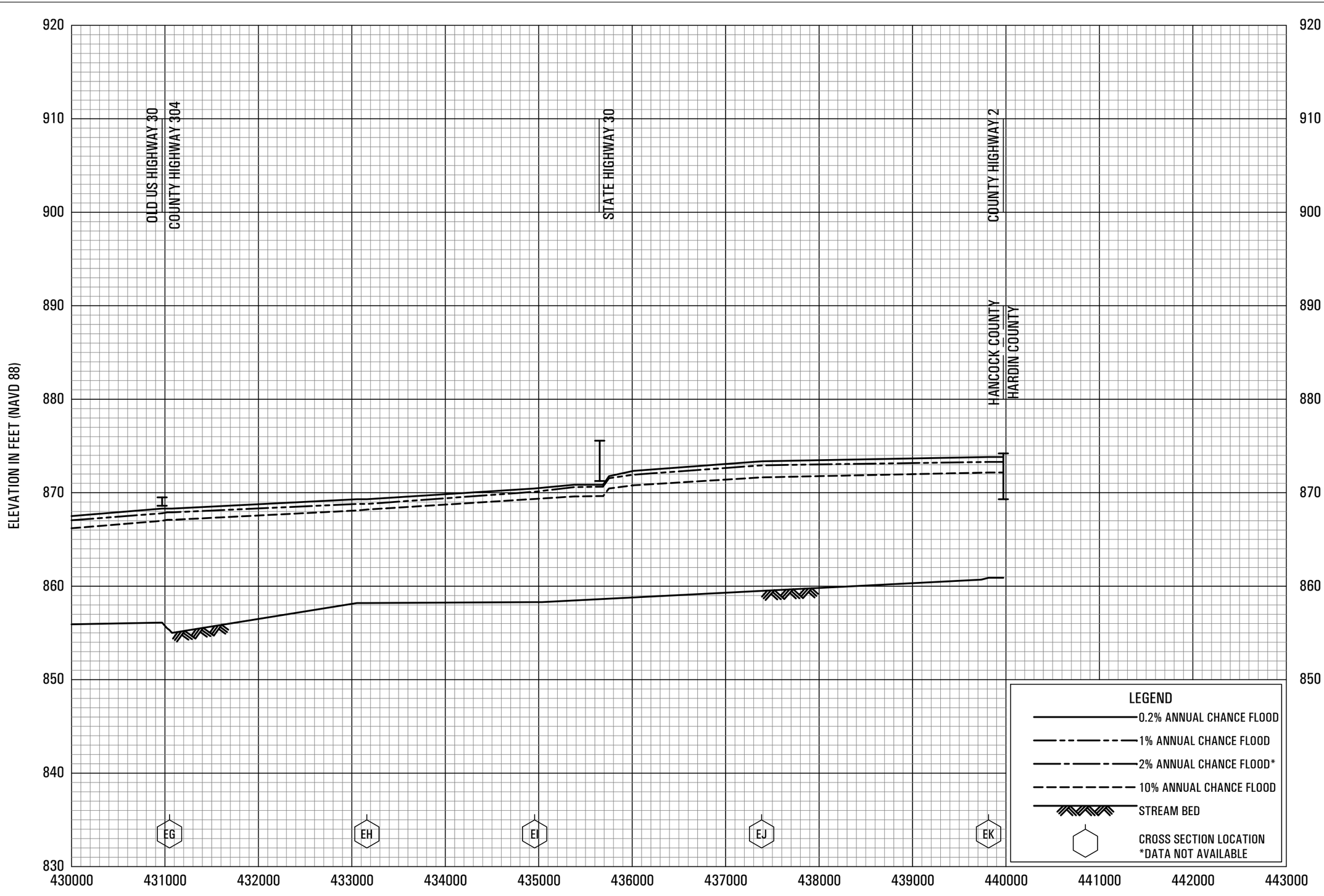


FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH
AND INCORPORATED AREAS



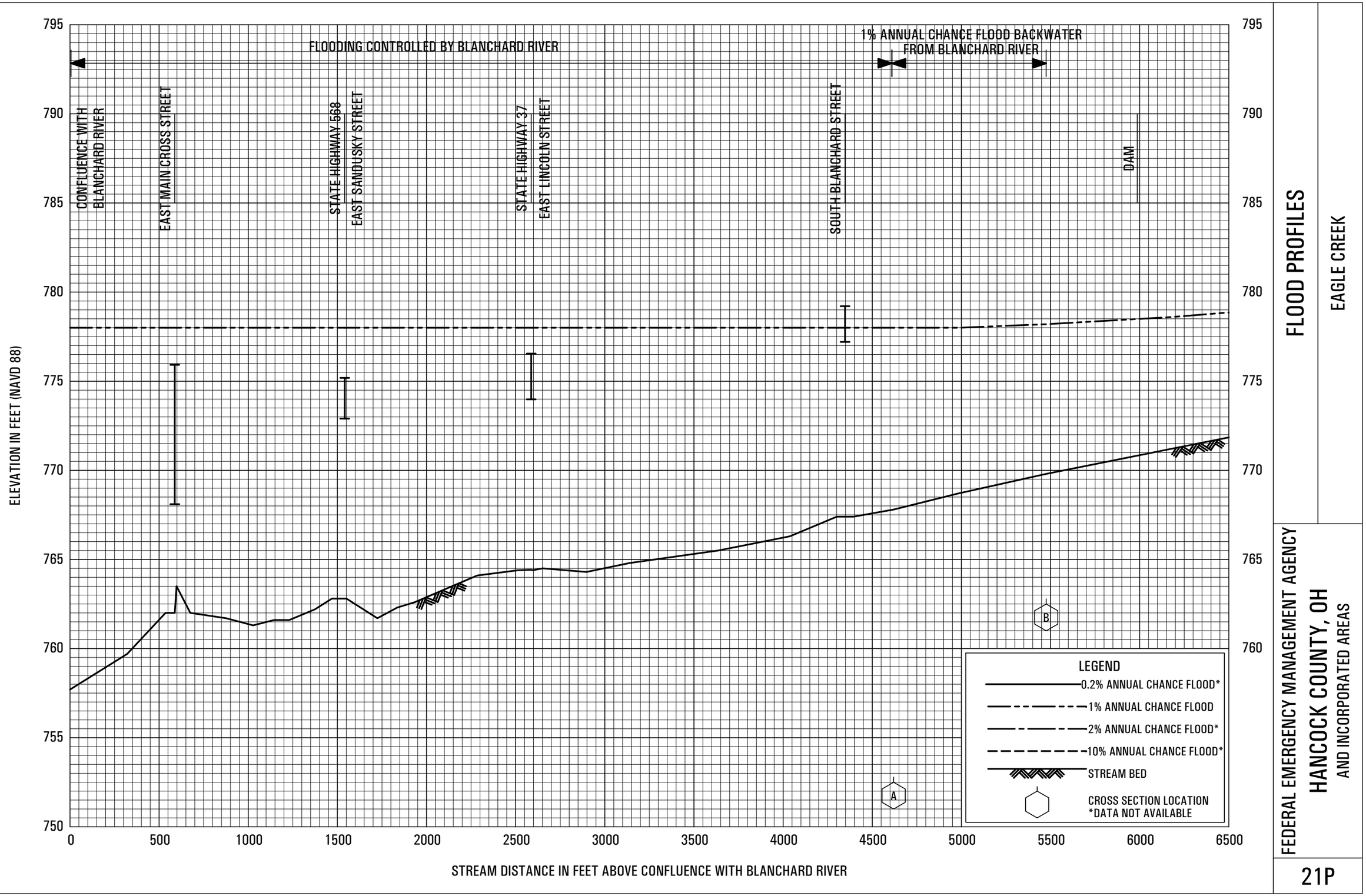
FLOOD PROFILES

BLANCHARD RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY , OH

AND INCORPORATED AREAS



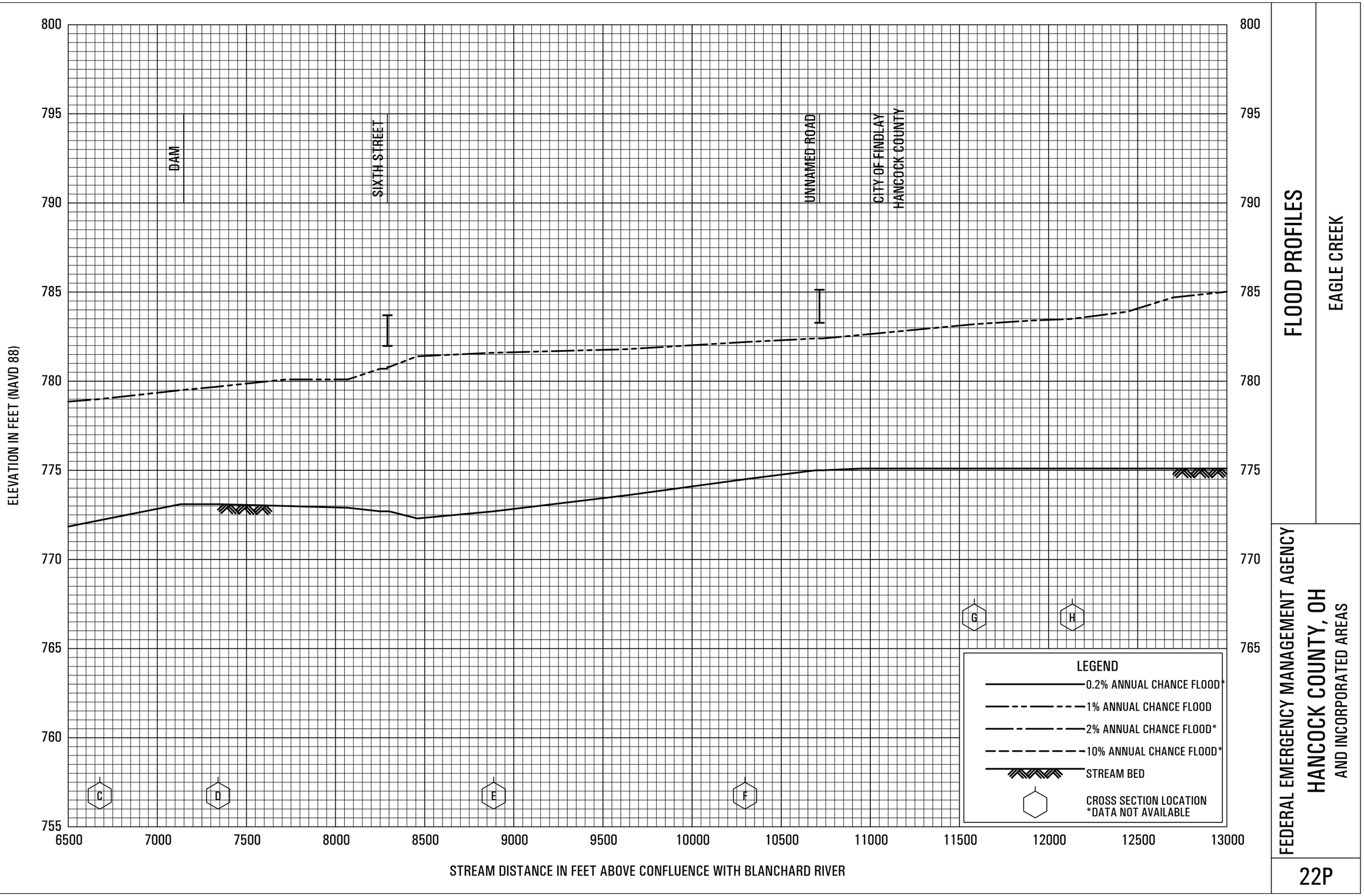
FLOOD PROFILES

EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



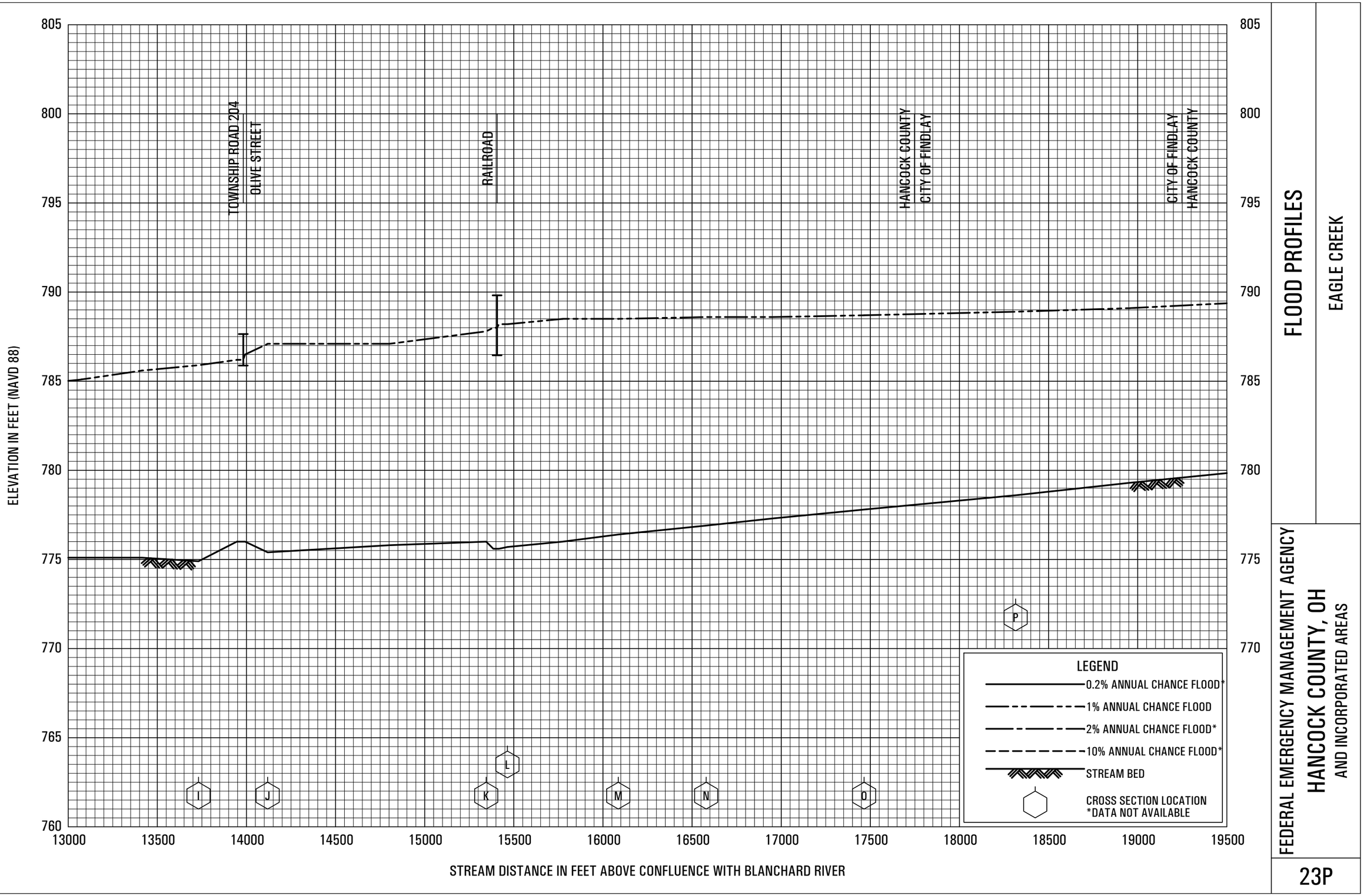
FLOOD PROFILES

EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



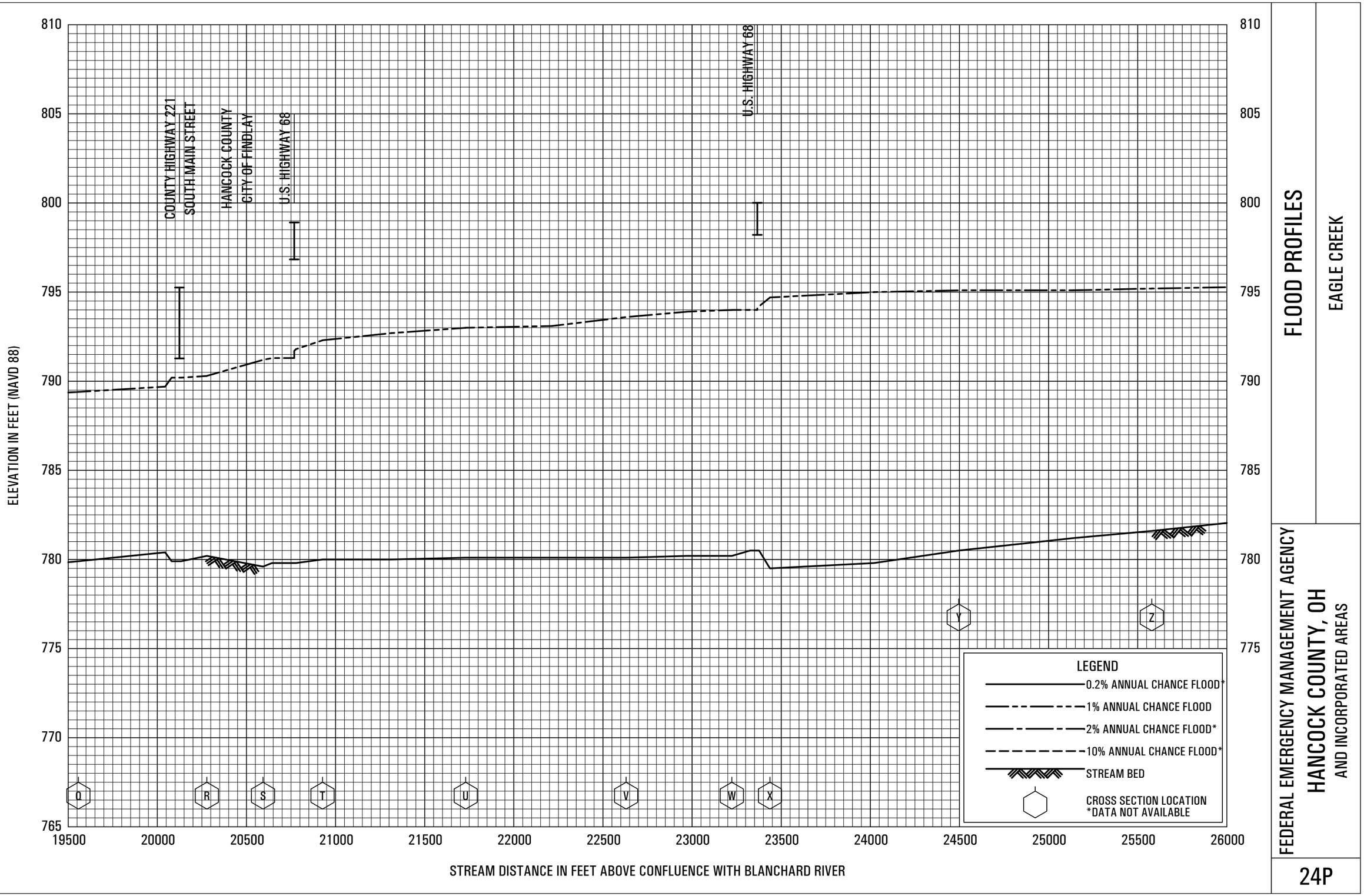
FLOOD PROFILES

EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



FLOOD PROFILES

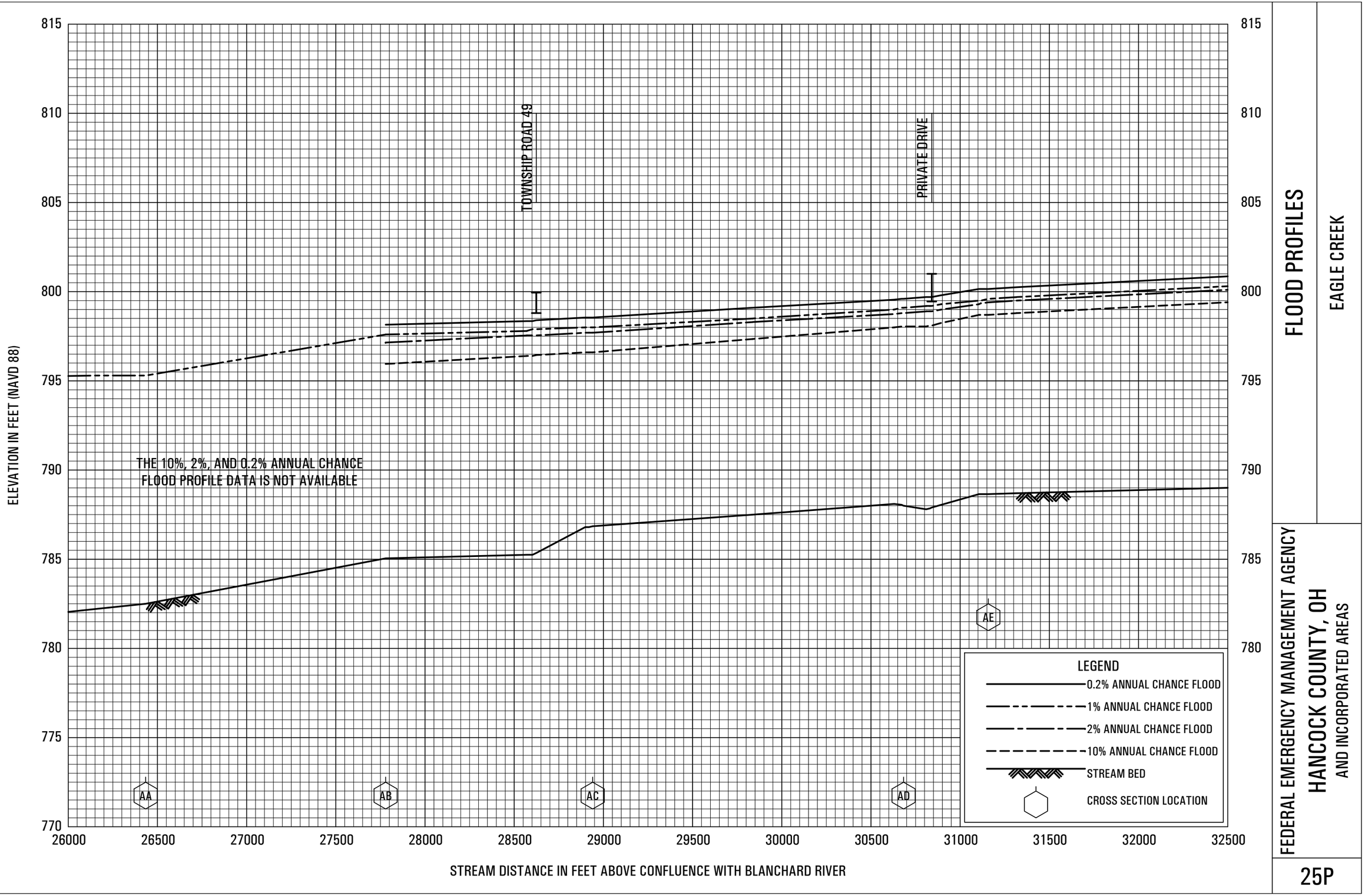
EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

24P



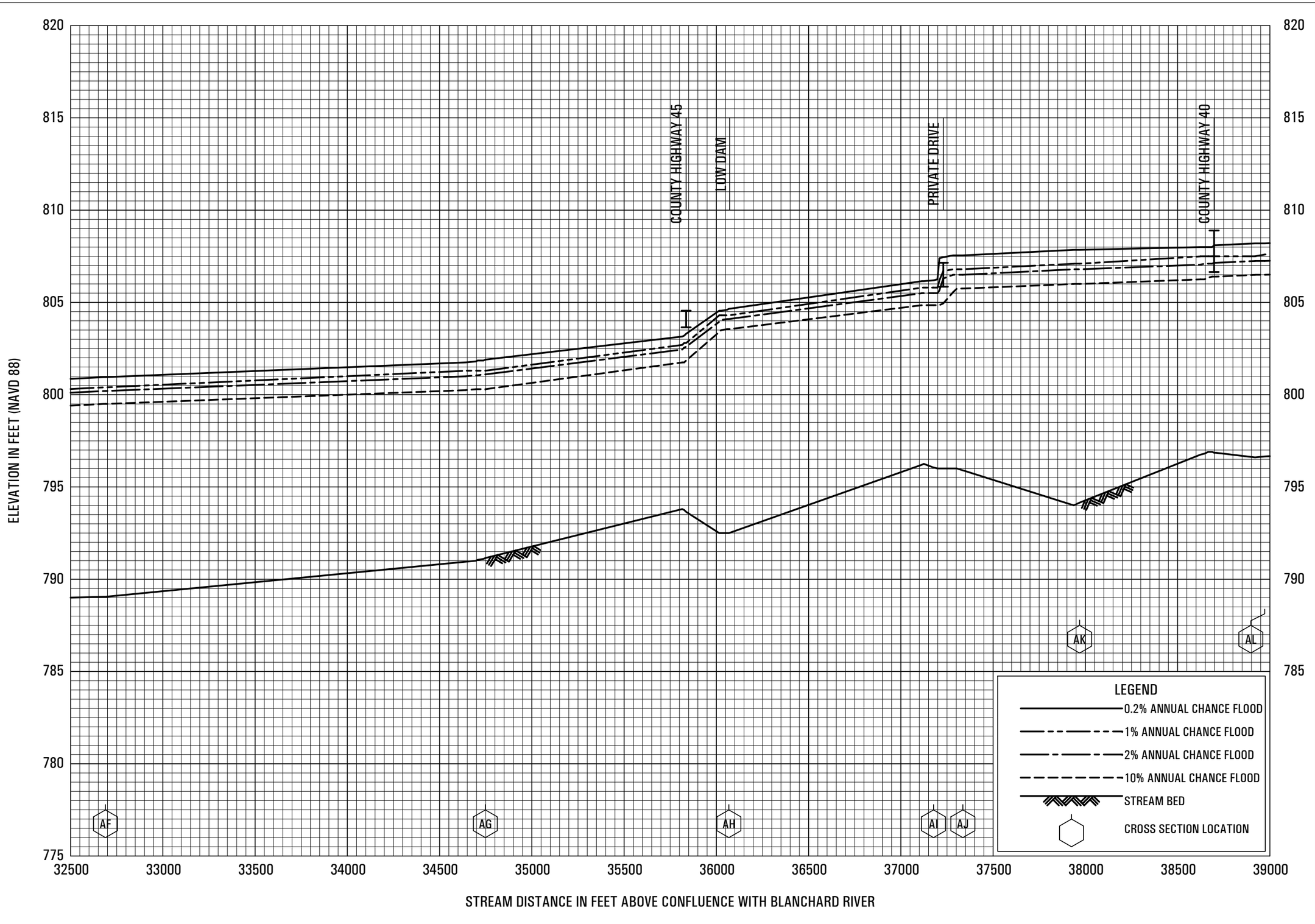
FLOOD PROFILES

EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



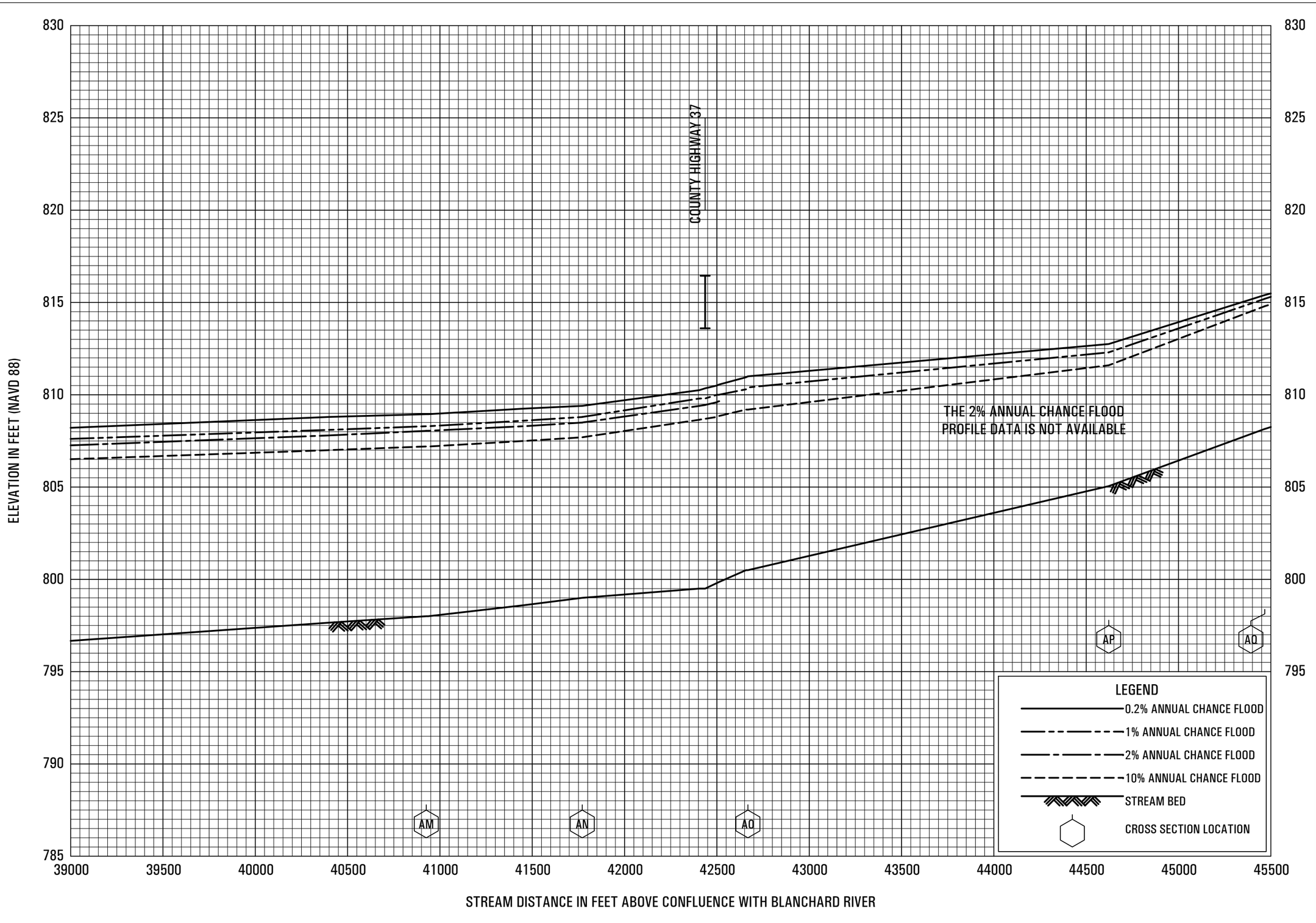
FLOOD PROFILES

EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



FLOOD PROFILES

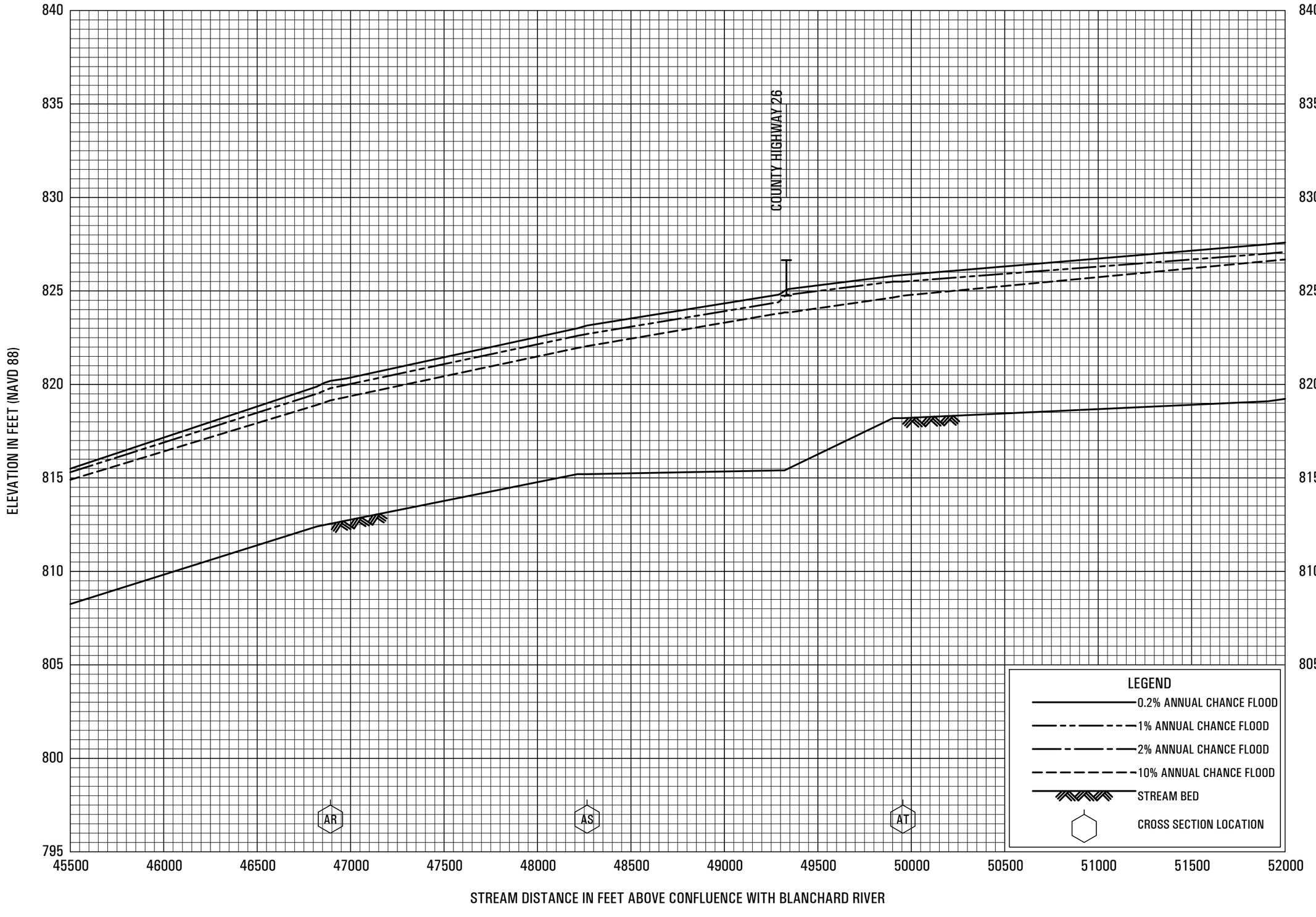
EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

27P



FLOOD PROFILES

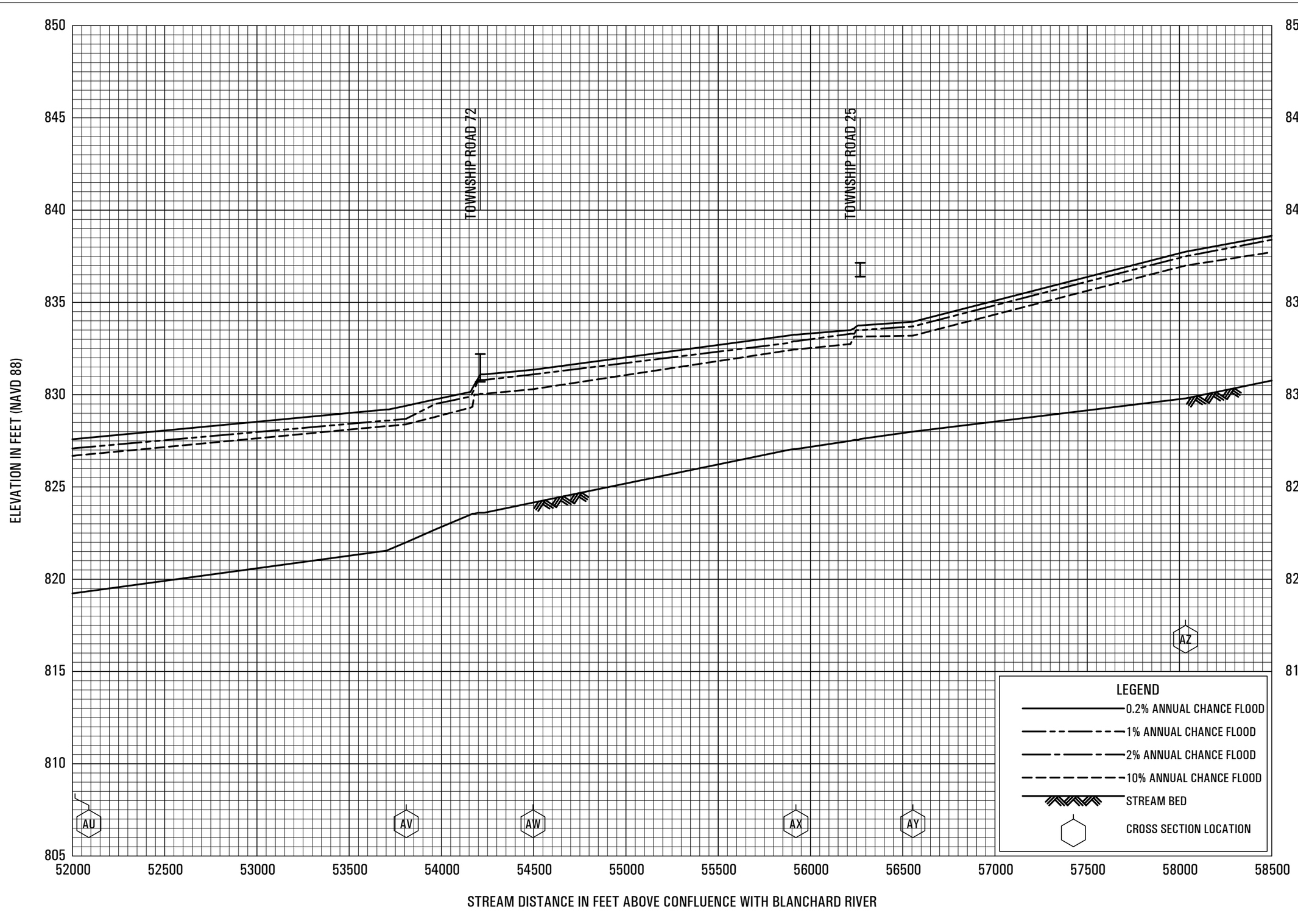
EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

28P



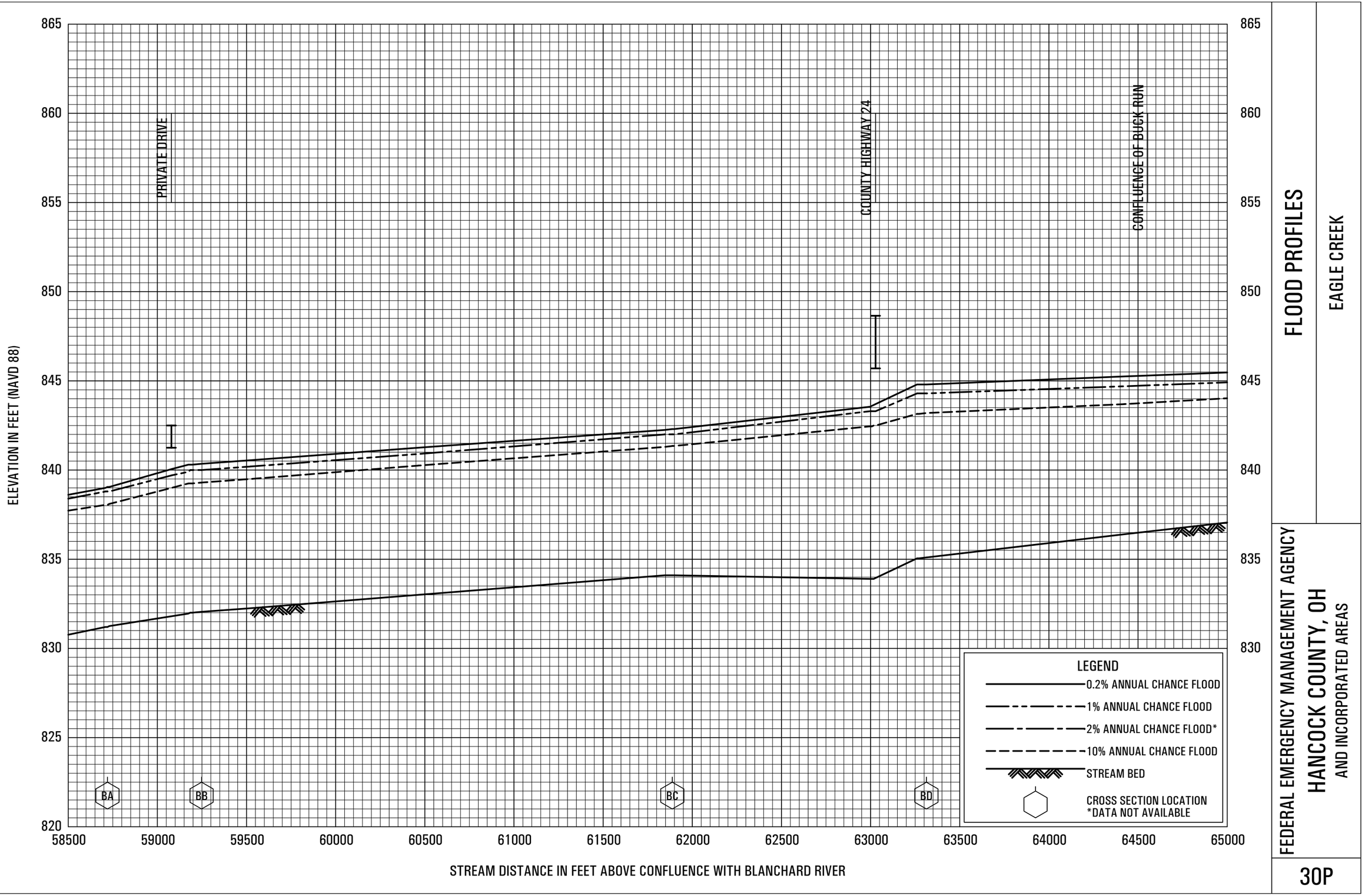
FLOOD PROFILES

EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



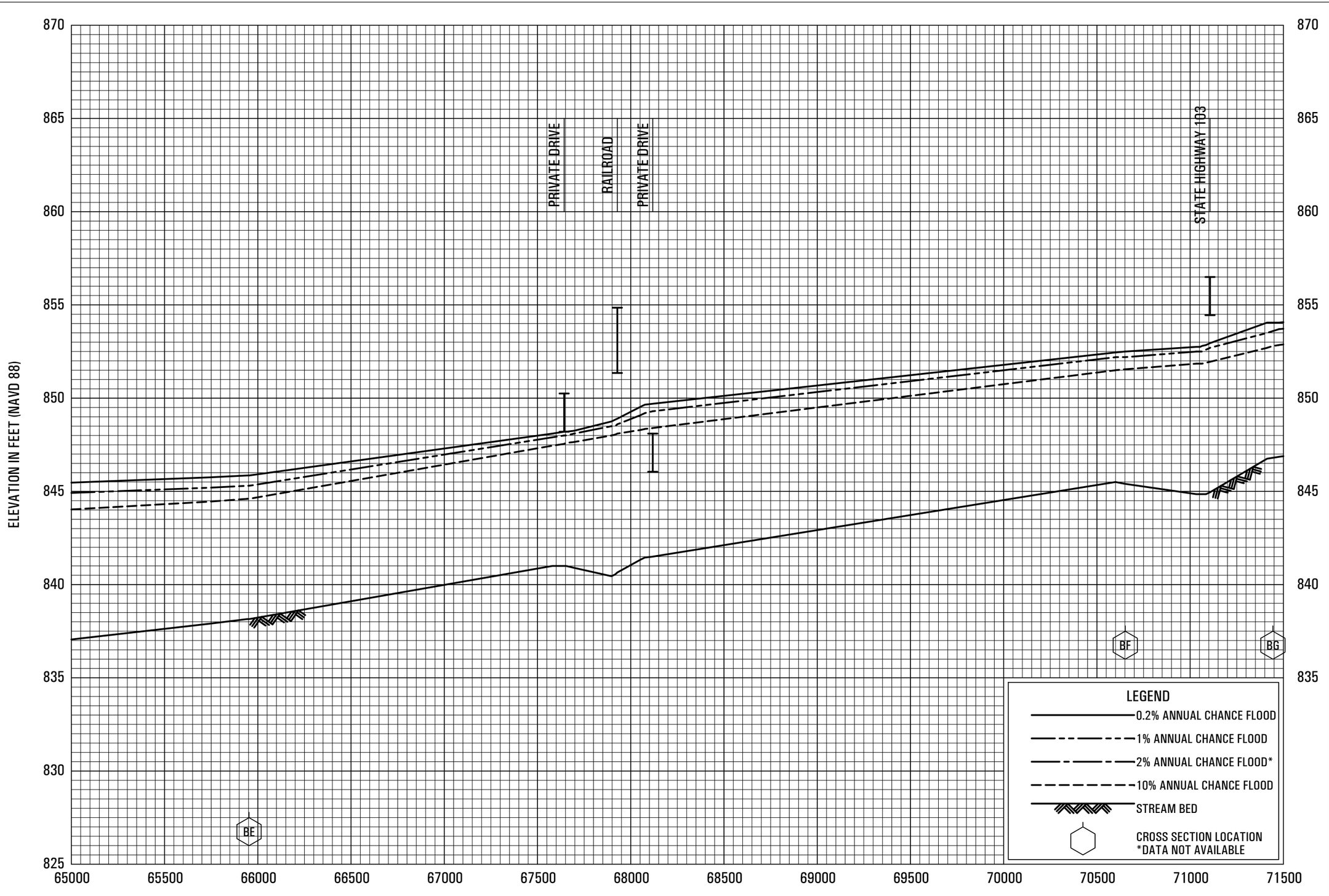
FLOOD PROFILES

EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



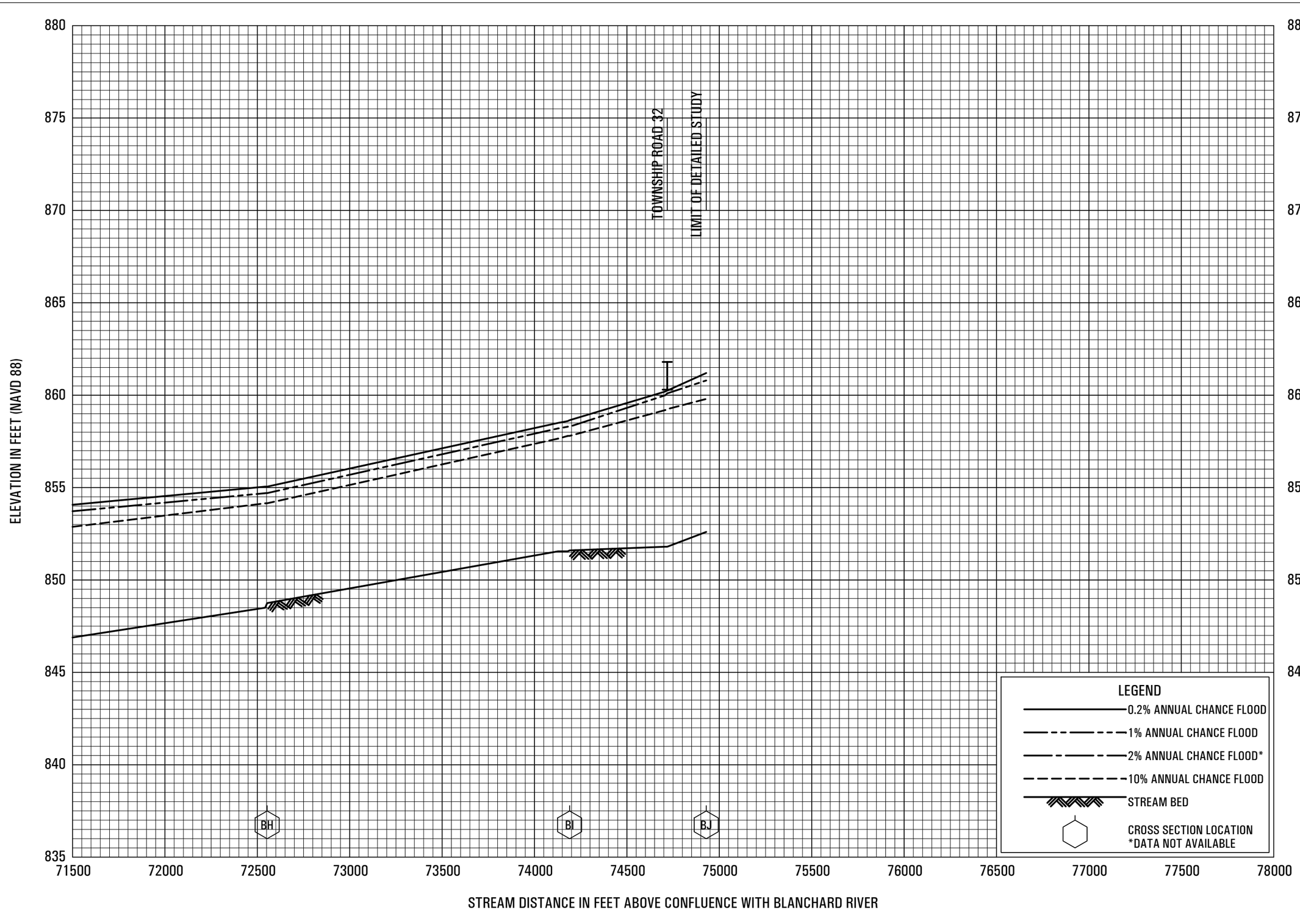
FLOOD PROFILES

EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



FLOOD PROFILES

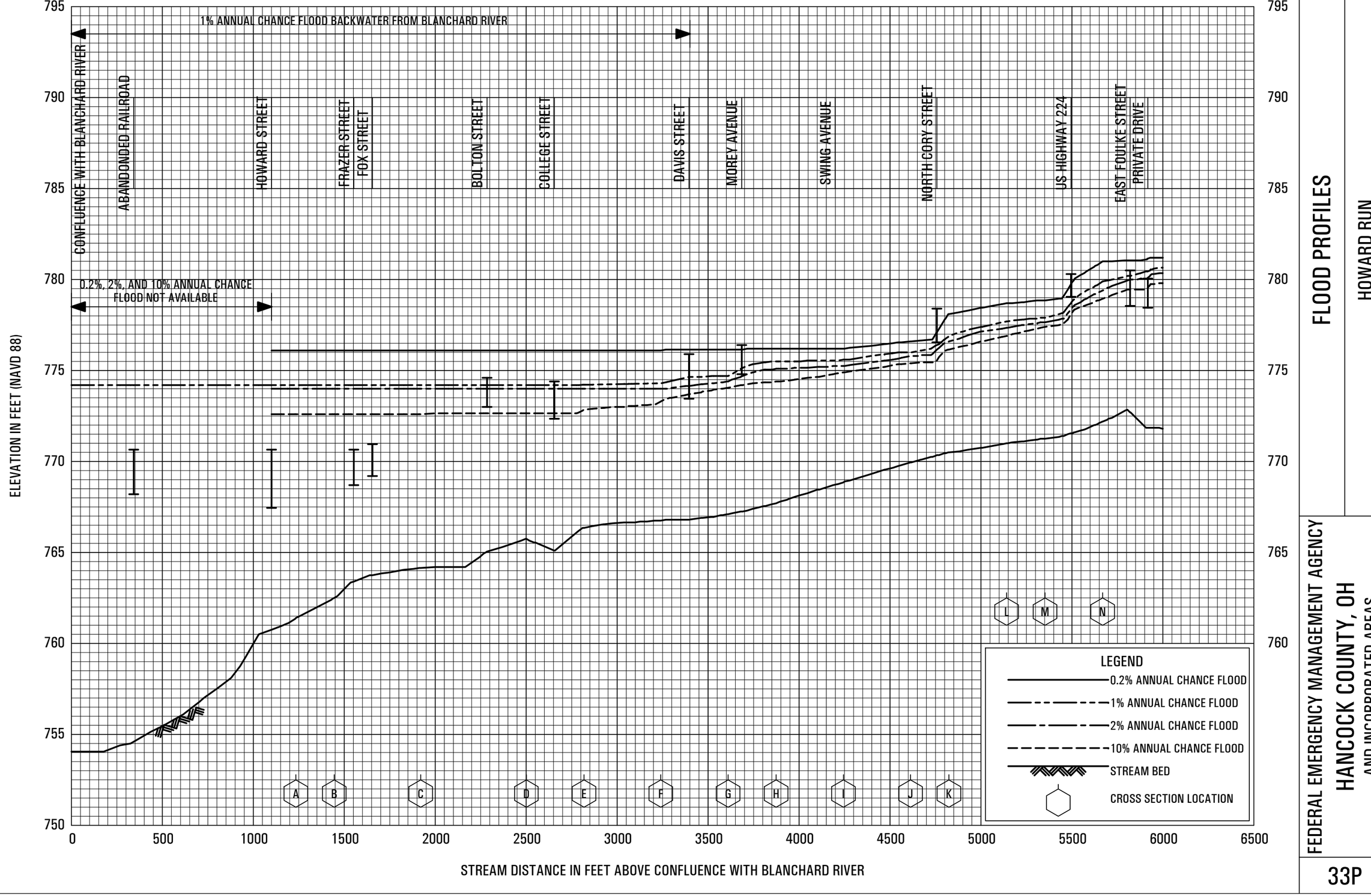
EAGLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

32P



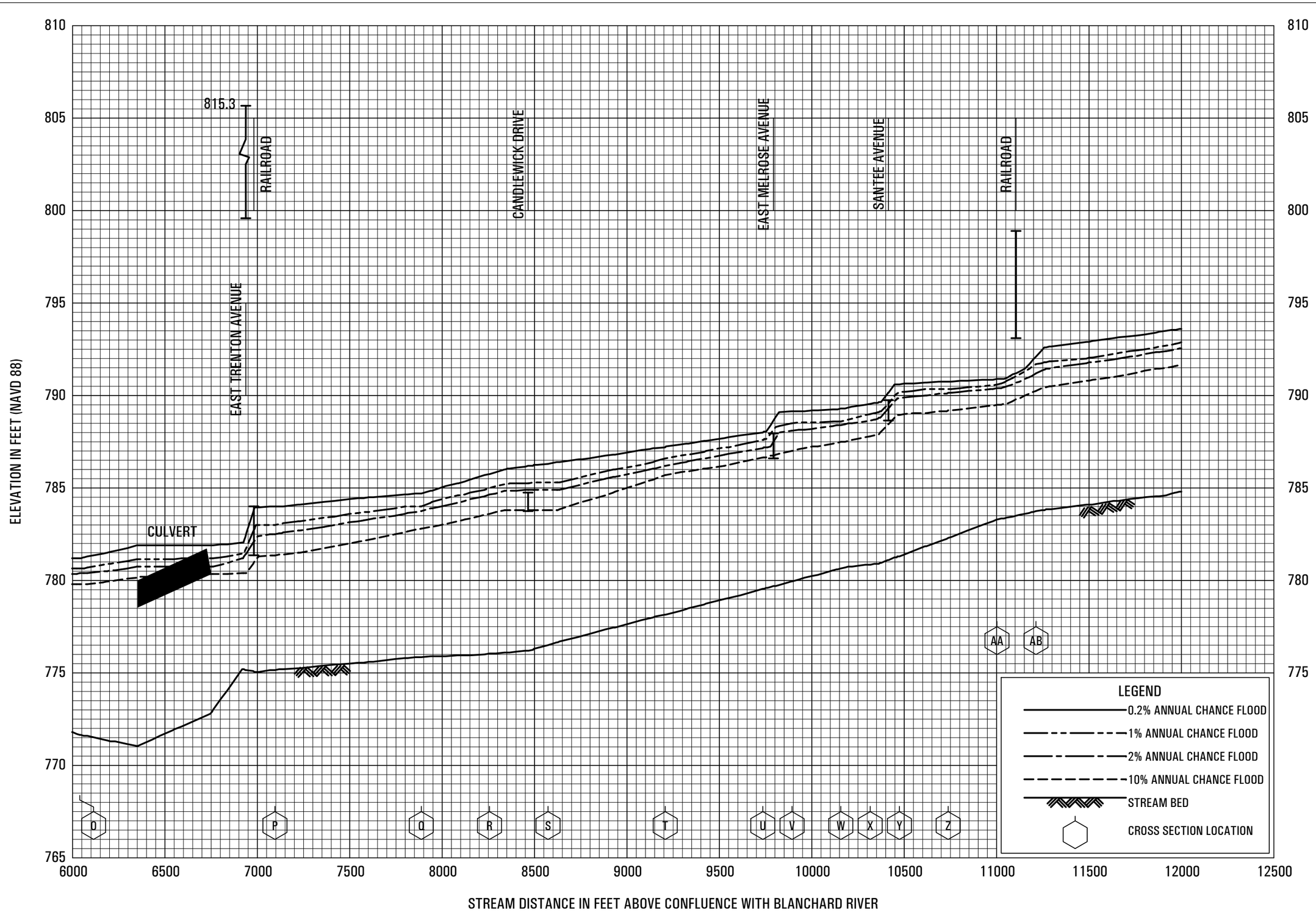
FLOOD PROFILES

HOWARD RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



FLOOD PROFILES

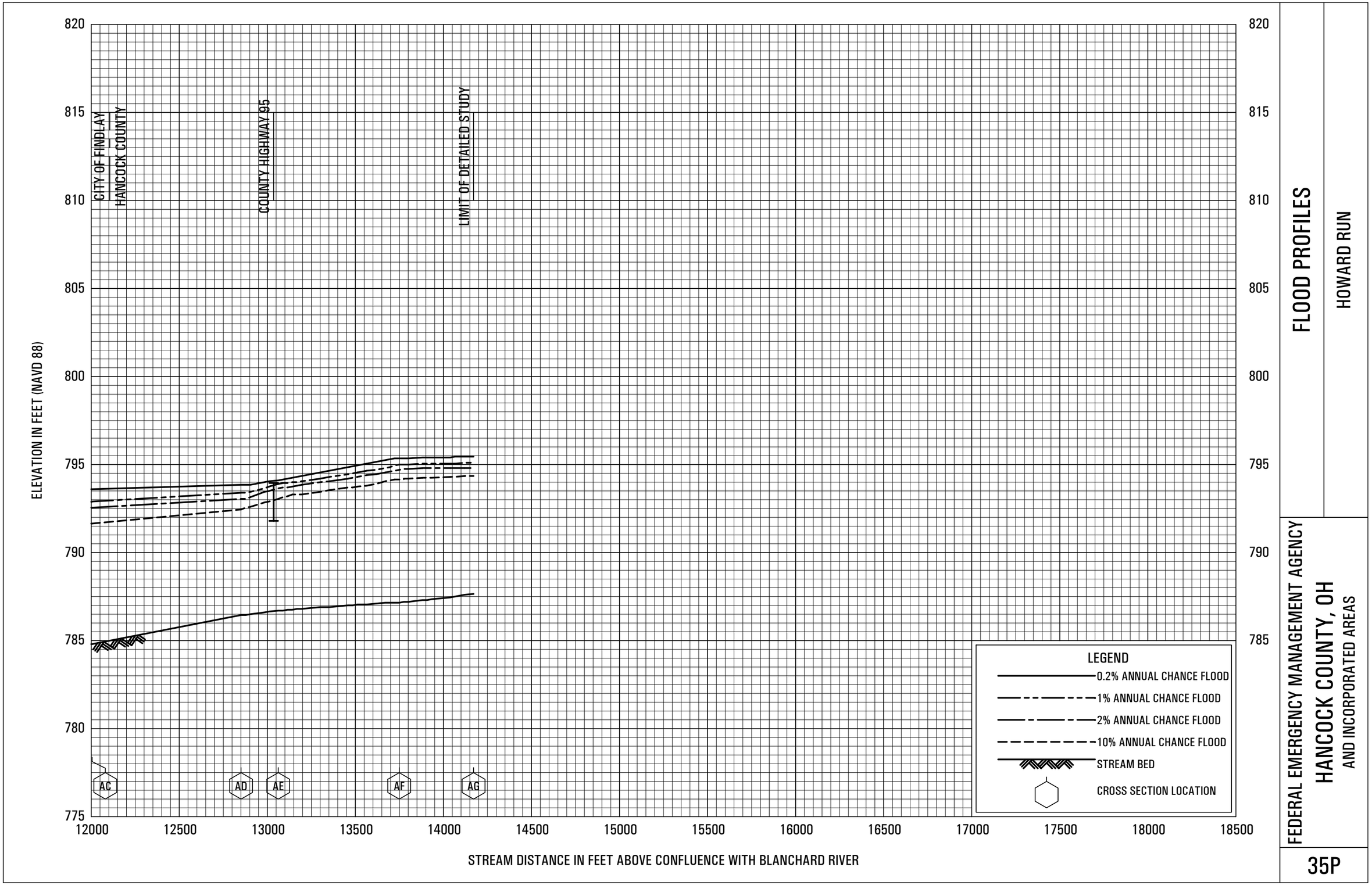
HOWARD RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

34P



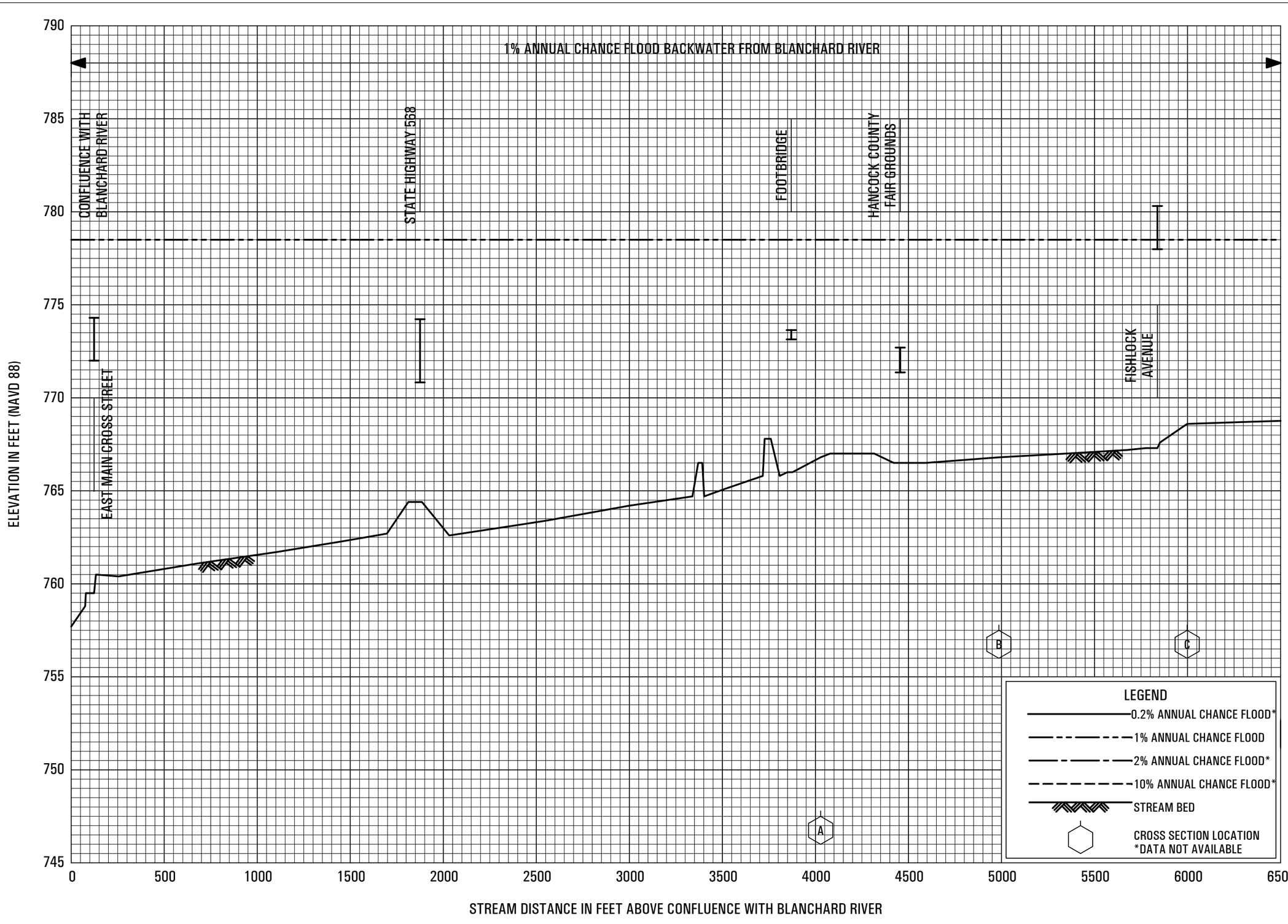
FLOOD PROFILES

HOWARD RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



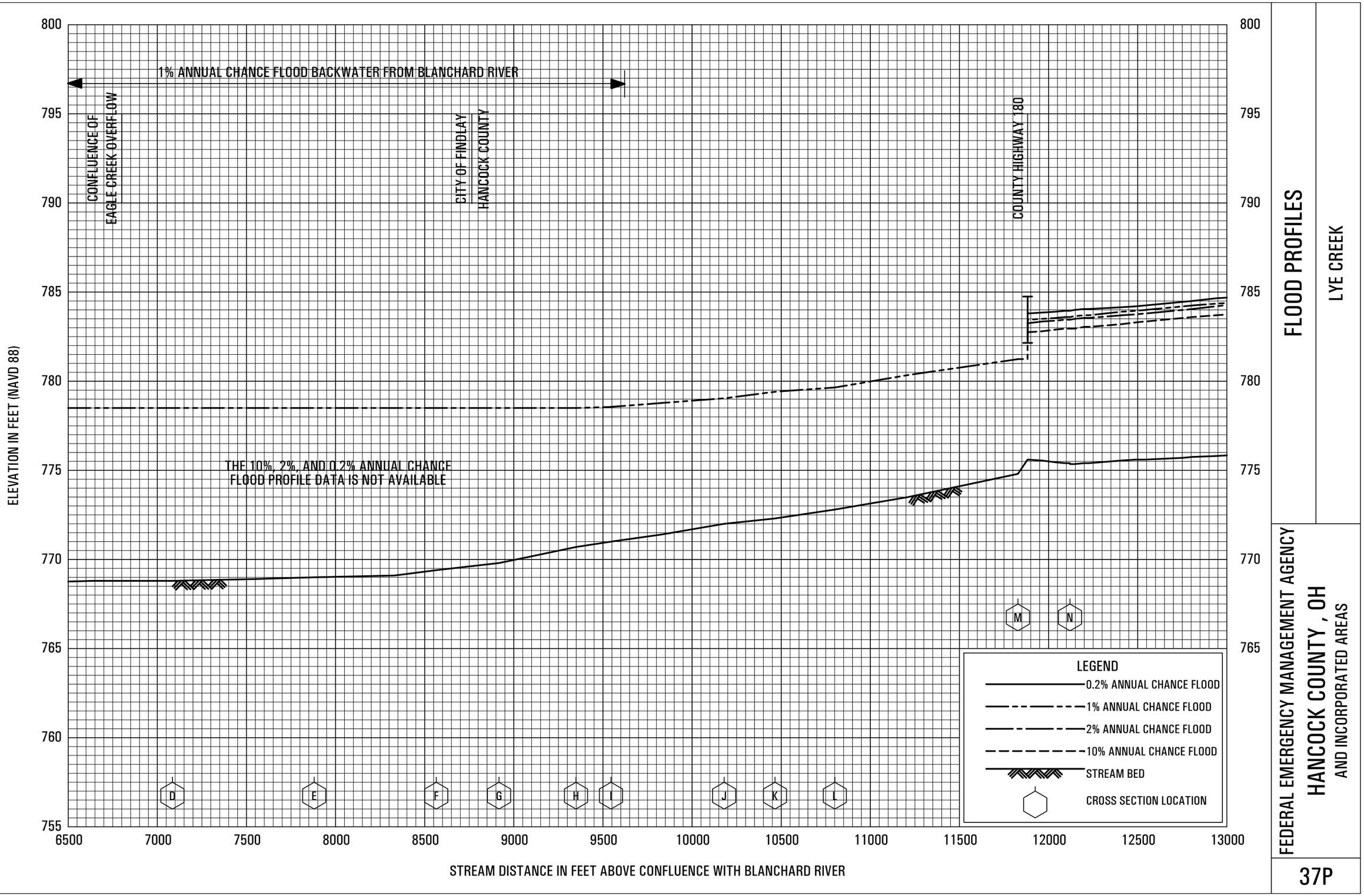
FLOOD PROFILES

LYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS



FLOOD PROFILES

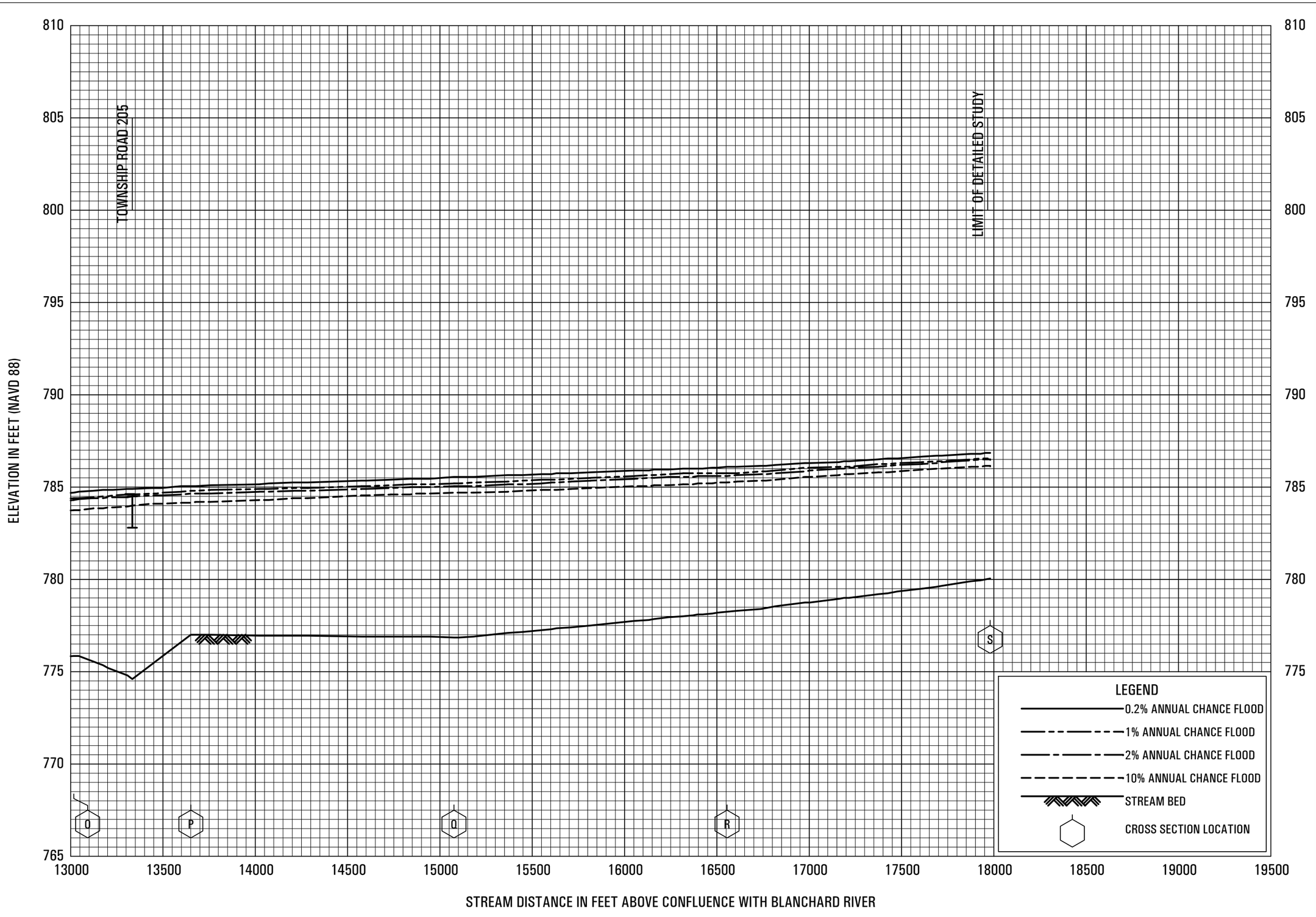
LYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

37P



FLOOD PROFILES

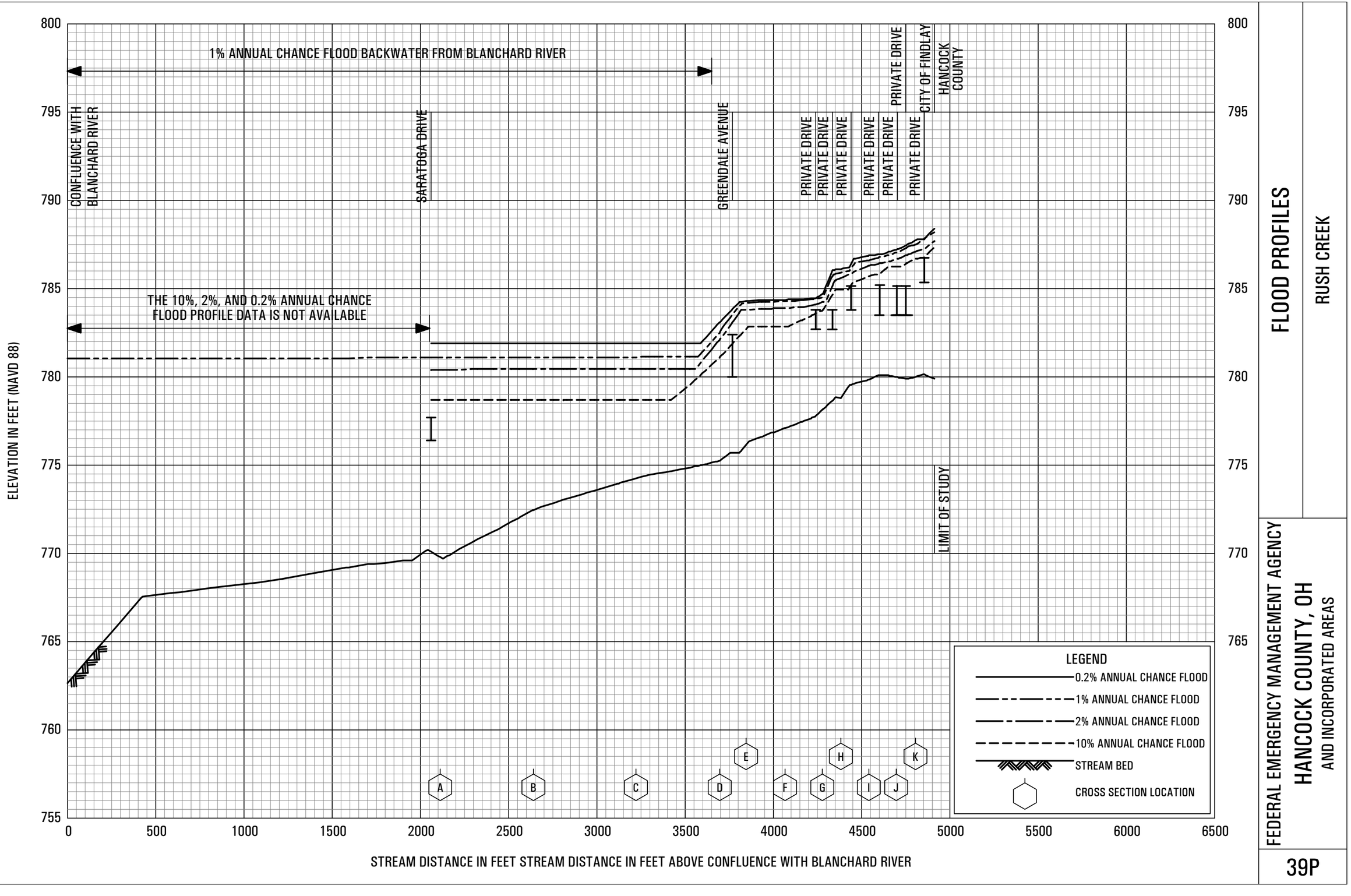
LYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

38P



FLOOD PROFILES

RUSH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, OH

AND INCORPORATED AREAS

39P